SOIL SURVEY OF GEORGETOWN COUNTY, SOUTH CAROLINA.

By W. E. McLENDON, G. A. CRABB, M. EARL CARR, and F. S. WELSH.

DESCRIPTION OF THE AREA.

Georgetown County, S. C., is situated in the eastern part of the State, fronting on the Atlantic Ocean. It comprises an area of 517,120 acres, or 808 square miles. In the direction of the coast, or at an angle about 20° east of north, it has an average length of near 35 miles and perpendicular to this a width of 24 miles, while due north and south through the center it attains a maximum length of 45 miles. The adjoining counties are Marion and Horry on the

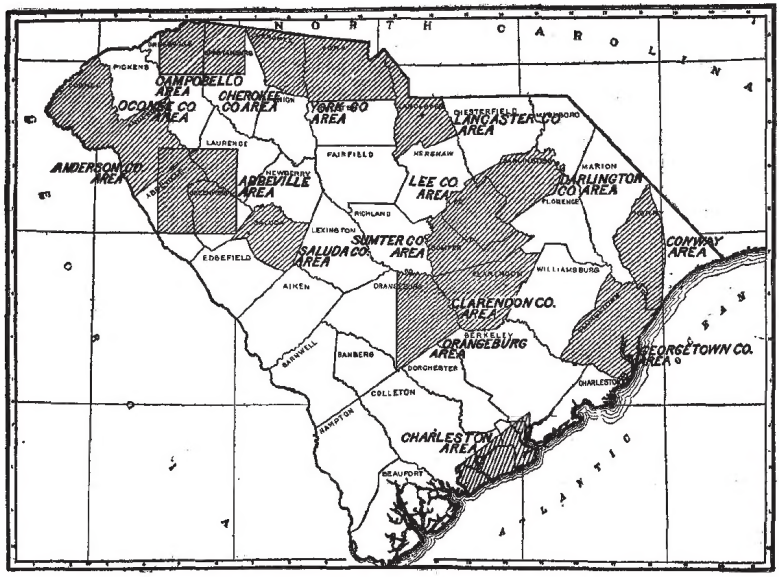

FIG. 11.—Sketch map showing areas surveyed in South Carolina.

north, Charleston and Berkeley on the south, and Williamsburg on the west. The eastern boundary is a smooth, slightly incurved beach, unbroken except by the mouths of the Santee River and Winyah Bay, a short distance farther north, and a few tidal inlets to the salt-water marshes just back of the beach sands. Winyah Bay is a beautiful, narrow body of water, extending first north, then west, then north again, a total distance of about 12 miles to the southeast

central part of the county, where it receives the drainage of the Pee Dee, Waccamaw, Black and Sampit Rivers. Paralleling the Waccamaw River to the Horry County line, the Pee Dee swings more to the west and forms over half of the northern boundary. The Santee River, with its lower prong, the South Santee, flows along the entire southern boundary.

The Black River crosses the county almost centrally from west to east, although very crooked in detail, and the Sampit, a deep tidal stream of local origin, extends nearly due west from the head of Winyah Bay. The county lies wholly within the low seaward portion of the Atlantic Coastal Plain, or what perhaps is better known locally as the flat, piny-woods region of the State.

The surface features are those of an old ocean-floor plain that has not been badly dissected by stream action, and vast tracts are so level as to be imperfectly drained. From an elevation of 40 feet above sea level along the western boundary there is a gradual slope seaward at the rate of between 1 foot and 2 feet to the mile until the edges of the salt-water marshes are reached, where the uplands are not more than 2 to 5 feet above tide. Above the general level of the plain is a low, broad, ancient, sandy beach line, crossing the northwestern corner of the county, which is level to somewhat undulating in topography. Another of these old beach lines, ranging from one-half mile to 2 miles wide, crosses the west-central part of the county from north to south, being from 5 to 10 feet higher than the adjoining lands on each side. It is level to gently undulating, except where it is cut through by the Black River, here becoming more irregular and more like the typical sand-hill country. Next to these the greatest irregularities are found in the steep slopes bordering all of the river swamps and the creek swamps along their lower courses.

On Sandy Island, between the Pee Dee and Waccamaw Rivers, and also in places along the western edge of the Waccamaw Neck, overlooking the Waccamaw River bottoms, the surface is irregular and hummocky, probably as the result of wind action. The salt-water marshes, lying between the sand plains on the west and the narrow sandy beach line on the east, form almost a continuous strip from the Horry County line to the Santee River. Below Winyah Bay they average from 2 to 3 miles wide, while north of the bay they begin wide, but point out at North Inlet and on north to the Horry County line they are much narrower. Farther inland are a number of slightly depressed areas through the uplands, which for the most part are known as bays and savannas. All such areas are in a semiswampy or swampy condition, and most of them are heavily timbered with water-loving trees, shrubs, vines, etc., the term "savanna" being applied as a rule only to areas in practically a true prairie condition. The most important of the bays, which lie

just east of the old beach line through the west-center of the county, are Carvers Bay, between the Black and Pee Dee Rivers, Gapway Bay, between the Black and Sampit Rivers, and Big Kilsock and Little Kilsock Bays, to the south of the Sampit.

The elevation of the county is not sufficient for the development of extensive systems of local drainage. It will be noticed from the accompanying map that the large bodies of upland between the rivers have very few streams of any consequence. Here and there is a narrow, swampy swale, through which the surface waters slowly find their way, and these converge into deeper, swampy drainage-ways, and finally near the rivers develop into deep, sluggish creeks. The rivers have been very little influenced by the local creeks. In their meandering courses to the sea they have carved out wide overflow plains. Probably on account of a slight sinking of the coast region within recent geological time the rivers have ceased to be streams of erosion, and are now gradually filling in their valleys. Not only are they influenced by the tides to beyond the western boundary of the county, but their bottoms for a distance of some 15 miles inland are overflowed by the tides just as the salt-water marshes near the coast. The importance of this feature in the development of the rice industry is discussed at some length in subsequent chapters.

A narrow belt of uplands along the Santee River Swamp is drained by a few creeks and smaller affluents of the Santee River. The south-central part of the county is drained by the Sampit River. This is a wide, deep tidal stream for a distance of about 10 miles from the bay, then it divides into a number of smaller streams which reach quite an extensive area. Its most important tributaries are Ports and Pennyroyal Creeks and Bond, Boggy, and Cedar Swamps. The Black River drains a wide strip through the center of the county and the Pee Dee a narrower belt along the northern edge. The chief tributaries of the Black River are Six Mile and Lanes Creeks on the south side and Black Mingo, Choppee, and Peters Creeks on the north side. Port Creek, Yauhannah Creek, Cypress Swamp, and Chapel Creek are the largest streams reaching the Pee Dee River.

The earliest settlements in Georgetown County were made near the head of Winyah Bay about 1705. The land on which Georgetown now stands was laid out in lots some time between the years 1830 and 1835, and the town thus founded was called Georgetown. Most of the settlers were English, either coming over direct from England or moving in from Charleston, which was founded at an earlier date. The majority of the families had means to start with. They took extensive bodies of the river and creek bottom lands for rice culture and in conjunction with these generally extensive upland tracts to be used principally for grazing purposes; they built fine houses and acquired large numbers of slaves. Here, indeed, de-

veloped a landed aristocracy, which for culture and refinement was not excelled anywhere else in the country. The development of the back country, so called, or uplands, has been very slow and is still very sparsely settled, except in a few localities. The settlers here were mostly nonslaveholders and farmed on a much smaller scale than the old rice planters.

The present population consists very largely of the descendants of the early settlers and their slaves. As early as 1800 there were 14,644 people in the county, of whom 12,406 were negroes. About the same ratio of white people and negro slaves continued until the Civil War, and there was a steady but gradual increase in the population all the time. With the freedom of the slaves the rate of increase in the population has been much slower, partly, no doubt, because some of the white people have been moving away. Another contributing cause is that many of the negroes are moving to other sections to work on the railroads, etc., this being most noticeable in the last 10 years. The more recent returns of the census give the population of Georgetown County as 20,857 in 1890, 22,842 in 1900, and 22,270 in 1910.

Georgetown, at the head of Winyah Bay, is the county seat and only town of importance in the county. It has a population of 5,530. Besides the regular mercantile business of the town, the largest lumber plant in the East is located here, with a capacity of 500,000 feet of lumber a day. In connection with this is an alcohol plant, with a capacity of 2,200 gallons a day, which uses all of the sawdust and other refuse in the manufacture of ethyl alcohol. Another plant near by extracts spirits of turpentine from the old longleaf pine stumps, logs, and limbs now so abundant over the entire coast region of the State. Nearly all of the local farm products are marketed in Georgetown or pass through its port on their way to Charleston and other larger markets. Andrews is a small town in the western part of the county which is growing rapidly. Among the crossroads villages which do considerable business may be mentioned Sampit, 10 miles west of Georgetown; Rhems, on the Williamsburg line; and Carvers Bay, in the north-central part of the county.

Owing to the very thinly settled condition of the county there are very few roads. The construction of roads is a very simple matter, however, and no doubt others will be opened up as needed. Travel across the Santee and Pee Dee Rivers is done only by ferry, there being two such crossings for public travel on each of these streams. The Sampit is ferried at Georgetown and the Black River at all of the crossings except at the Williamsburg line, where a good bridge has been built. The Waccamaw Neck is entirely cut off from the mainland and can be reached only by boat.

The railroad facilities consist of the Georgetown & Western Railroad, which extends in almost a straight line from Georgetown to Lanes, in Williamsburg County, there connecting with the main line of the Atlantic Coast Line Railroad from north to south and another line leading to Sumter and Columbia. For the region south of the Black River this affords fairly good facilities, but no railroad is within reach of the region north of Black River. A line from Andrews is being extended north and probably will be built through to Marion in the near future. While without adequate railroad facilities, the county is very favorably situated in reference to water transportation. The Santee and Pee Dee Rivers are navigable to the edge of the Piedmont or to Columbia and Cheraw, respectively. The Black River is navigable as far up as Kingstree; the Black Mingo to Rhems, the Waccamaw to above Conway in Horry County, and the Sampit for a distance of about 10 miles. To make the trip from the Santee River to Georgetown shorter the United States Government has cut and maintains the Estherville-Minim Creek Canal, 6 feet deep at mean tide and 75 feet wide. With the rice industry nearly abandoned the river shipping is not very heavy, but boats now ply between Georgetown and Columbia, Cheraw, Conway, Rhems, and several local points within the county. Ocean service is maintained to Charleston, Savannah, and New York. By water the distance to Charleston is hardly 50 miles, while by rail it is nearly 90 miles.

CLIMATE.

The climatic conditions in the county approach semitropical in their nature and on the whole are healthful, pleasant, and adapted to a wide diversity of farming interests. The winters are very short, mild, and open, with little or no snowfall, and the summers are long and hot. The Atlantic Ocean along the eastern boundary, with the warmer Gulf Stream only about 50 miles offshore, has quite a modifying influence in shortening and tempering the winter season and in helping to maintain a relatively high humidity throughout the year. Other factors tending to modify the climate are the large streams, tidal marshes, large swampy inland areas, the Winyah Bay, and the low, level topography, with the poor attendant natural drainage. The effect of the ocean is felt throughout the county, but increases quite perceptibly as the coast is approached. This is shown by the plant growth, as well as in many other ways. Immediately along the coast the cabbage palmetto (the State emblem) flourishes, though it does not grow naturally any distance inland; the salt-water live oak extends from immediately along the shore to some 15 miles inland, and the magnolia occurs quite plentifully in and around the swampy areas near the coast, but is not found to any extent in the western part of

the county. The longleaf pine, less sensitive to local climatic influences, constitutes the chief tree growth on practically all of the uplands where partial and good drainage has been established, while in the swamps cypress and other water-loving trees abound.

Killing frost is not expected, as a rule, until about the 1st of December near the coast and from the middle of November to the 1st of December farther inland. After this the typical winter weather may set in, or perhaps as often balmy fall weather prevails until the first of the year. Generally January and February are the coldest and most disagreeable months. They are characterized by frequent sharp changes in the weather, varying from quite warm to cool and disagreeable. The coldest nights, when the temperature goes below freezing, are attended by thin skims of ice and the soil freezes to a depth of an inch or so. Spring opens the latter part of February or 1st of March and by May the weather becomes quite warm. June, July, and August, with a mean temperature of 79° F., are the hottest months. At times during these months, especially the latter two, short periods of very hot sultry weather occur, which are rather oppressive, although not any hotter or more unbearable than similar periods occurring as far north as Canada. The fall weather, including the latter half of September, October, and November, is the most pleasant of the year.

The annual precipitation, averaging about 50 inches, is well distributed throughout the year, but the greatest rainfall occurs as showers during the hot summer months, when needed most by the growing crops. The disastrous effects of too much rain can be overcome to a large extent by thorough drainage, and of drought, which generally is not of long duration, by good methods of tillage and cultivation, keeping the soil well supplied with organic matter.

The growing season, or the time between the last killing frost in the spring and the first in the fall, is about nine months, being from 4 to 6 weeks longer than that of the central region of the State and nearly 2 months longer than that of the upper Piedmont region near the mountains. This gives a great advantage in the production of crops, besides making it possible to keep stock upon green pastures the year round. The winter months are so mild that no expensive housing is required. Planting can begin very early and the crops have longer to mature in the fall. The early warm springs are especially adapted to the growing of early truck for the northern markets. The crops would mature soon after those of the Florida trucking districts, when the market is not oversupplied and the prices generally high.

Possibly a more concrete idea of the climatic conditions can be had from the table below, which was compiled from the records of the Weather Bureau station at Charleston, in the adjoining county

to the south. The conditions at Charleston are particularly applicable to the eastern part of the county, where the influence of the ocean is most strongly felt. Farther inland some allowance should be made for slightly shorter growing seasons and severer frosts during the winter months.

Normal monthly, seasonal, and annual temperature and precipitation at Charleston.

Month.	Temperature.			Precipitation.			
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.	Snow, average depth.
	° F.	° F.	° F.	Inches.	Inches.	Inches.	Inches.
December	51	78	13	3.2	1.8	5.8	T.
January	50	80	10	3.6	2.2	0.6	T.
February	52	80	7	3.4	3.6	2.4	T.
Winter	51	.....	.....	10.2	7.6	8.8	T.
March	58	86	24	3.8	2.4	2.5	T.
April	65	89	32	3.2	1.6	4.9	0.0
May	73	98	45	3.6	4.3	3.8	0.0
Spring	65	.....	.....	10.6	8.3	11.2	T.
June	79	100	51	5.4	1.2	15.0	0.0
July	82	104	64	7.4	5.5	11.3	0.0
August	81	100	62	7.3	5.0	5.1	0.0
Summer	81	.....	.....	20.1	11.7	31.4	0.0
September	76	95	49	5.5	0.4	11.3	0.0
October	67	93	39	4.0	0.9	14.3	0.0
November	58	83	23	3.0	0.8	1.4	0.0
Fall	67	.....	.....	12.5	2.1	27.0	0.0
Year	66	104	7	53.4	29.7	78.4	T.

Average date of first killing frost in autumn, Nov. 30; of last in spring, Mar. 3. Date of earliest killing frost in autumn, Nov. 9; of latest in spring, Apr. 2

AGRICULTURE.

Rice culture was the chief incentive leading to the early settlement and subsequent agricultural development of Georgetown County. A small amount of the seed brought from Madagascar and introduced at Charleston as early possibly as 1693 marked the beginning of the industry in this country. It proved especially adapted to the wet lands which occur so extensively along the coast; and not only that, but it proved a profitable crop from the start. Hence it was only a short time until a large portion of the lands considered available for the purpose were taken and developed. Generally, how-

ever, only families with influence who could get grants from the royal governor of the province came into possession of these lands, some of the grants containing several thousand acres. At first the chief consideration in selecting rice lands was to get a wet, mucky soil susceptible of partial drainage, the importance of irrigation not being known until some time afterwards. Answering the requirements in Georgetown County were all of the tidal lands along the Santee River to within a mile or two of the coast; along the Pee Dee and Waccamaw Rivers to north of Bull Creek; the Black River bottoms as far up as Browns Ferry; and the Sampit River bottoms for a distance of about 10 miles west of Winyah Bay. Besides, there were numerous smaller tidal areas along the bay front and extending short distances up the creeks and scattering swampy areas through the uplands. All such areas were heavily timbered originally with cypress, gums, etc., and an immense amount of labor was required to clear and put them in shape for cultivation. This, however, was not then an expensive undertaking, as the planters owned large numbers of slaves. With the development of the rice industry many new methods and inventions came into general use. The large amount of hoeing that was found necessary at first was subsequently reduced to a minimum by irrigation or flooding, and machinery did most of the work in preparing the grain for the market after it left the field. All of the lands found suitable for rice culture could not be irrigated, and two systems followed, known as dry culture and wet culture, the latter being by far the most extensive.

Dry culture was confined to wet areas not susceptible of irrigation, such as were found in many places through the uplands. Rows were laid 2½ to 3½ feet apart, and the hills were from 15 to 24 inches apart in the row and anywhere from 20 to 50 seeds to the hill. The yields ranged anywhere from 15 to 50 bushels per acre. Rice raised by the dry-culture method was highly prized for seed, as it was free from the seed of red rice and many weeds which thrived in the fields under water culture.

Three sorts of low land are suitable for wet culture of rice: First, the tidewater lands near the coast; second, river swamps, above tide but into which water may be conducted by canals taking water from the river above and returning it below; and, third, flat areas, generally in or near the creek bottoms, which may be irrigated from reservoirs formed by dams farther up the stream. In the water system of culture the superiority of the tidewater lands is easily seen. They lie in such a position that they can be irrigated on the rise of the tide and drained on the ebb, being practically free from the disastrous effects of freshets, which work such havoc farther up the rivers. They occur, however, only in those localities where the tidal water is river water. These are the alluvial belts along the larger

rivers above the heads of the bays and inlets reached by salt or brackish water, but below the points where the tidal ponding of the river water raises it above the flood plain level. Here the rice industry reached its most extensive and highest state of development. The yields ranged from 40 to 80 bushels to the acre.

The cultivation of rice proved so profitable that the planters gave very little attention to any other lines of farming. Around their homes, located on the dry, sandy lands overlooking the rice swamps, they had areas of uplands cleared, which were used in growing corn, sweet potatoes, garden vegetables, and a few other crops for home use. Rice can be used for so many purposes that it is not necessary to diversify to any great extent. The grain is a staple article of diet; the flour secured in the cleaning processes is a good feed for stock, and the straw makes fine forage. After the introduction of indigo in 1741 or 1742 it was grown in small patches by some and proved quite profitable. An act of the English Parliament placing a bounty of sixpence on the pound gave quite an impetus to the industry all through the Province of Carolina, and just before the Revolutionary War over 1,000,000 pounds were exported annually. The removal of the tax during the war caused a rapid decline in the industry, and by the end of the eighteenth century it had been practically abandoned and cotton began to be grown more extensively.

As early as 1800 the rice lands were valued at $50 to $300 an acre, and the average price was over $100 an acre. These high prices and a general prosperity prevailed until the Civil War. With the freeing of the slaves and the general demoralizing effect of the war upon labor and business in general many of the plantations were abandoned outright and many others were cultivated only in part.

Within more recent years, inability to compete with the rice of Louisiana, Texas, and Arkansas, where it can be grown and harvested by machinery almost entirely, has caused the industry to decline. At present only a very small acreage is planted, and a large number of the fine old houses have been abandoned and are now going to ruin. From the high prices before the Civil War the rice lands dropped to $20 to $30 an acre after the war, and now in their abandoned condition they can be had for a nominal sum. A better idea, perhaps, of the development and decline of the rice industry can be had from the different census reports dating back to 1850. In that year the total production of rice in the county had reached 46,765,040 pounds, while in 1860 the yield of clean rice was 55,805,385 pounds. In 1870, a few years after the Civil War, the total yield was only 5,324,970 pounds. Then by 1880 it had climbed to 10,627,889 pounds and continued about the same until 1900. From the 1909 yield of only 1,864,440 pounds it can be seen that the industry has been practically abandoned.

The extensive upland region of the county has never made much progress in agriculture. Settlements were slow and confined to a very large extent to the better-drained sandy lands and narrow strips of the heavier soils along the edges of the swamps, where fair drainage has been established. Farming here was of a mixed character, with corn as the main crop, although cotton was grown to some extent, and some other minor crops in small patches for home use. Nearly every farmer kept some cattle and hogs, which were allowed to roam at large over the extensive timbered areas. In this way it was possible to raise considerable stock at slight cost. Other means of livelihood were afforded by the heavy longleaf pine forests which occupied nearly all of the uplands. Some went into the turpentining industry and made large fortunes, and others in a more limited way also found it profitable. Turpentining reached its height in the eighties. Since then it has dwindled to scattering, comparatively small, areas; and the shortleaf pine, which in earlier days was not considered a profitable source of turpentine, is now being boxed. Burning tar from the fat, dead-pine logs was also an important industry for a while, some of the kilns yielding as much as 60 barrels at one burning. Lumbering continued to increase in importance until a few years ago, when about all of the available longleaf pine timber was exhausted.

According to the United States census reports the total acreage in farms in 1899 was 265,449, of which 36,169 acres were improved. The value of land and improvements, except buildings, was $937,960, and the buildings were worth $320,720. There were 8,850 acres in corn, producing 93,110 bushels; 1,690 acres in cotton, producing 689 bales; 1,159 acres in sweet potatoes, producing 77,289 bushels; 562 acres in oats, producing 12,800 bushels; and 928 acres in peas, producing 9,098 bushels. Among the minor crops were 107 acres in peanuts, 33 acres in sorghum, 10 acres in tobacco, 9 acres in sugar cane, and 461 acres in miscellaneous vegetables. In rice were 14,157 acres, producing 10,259,430 pounds.

With the rice industry practically abandoned, farming in Georgetown County has reached a low ebb. The conditions, however, are improving rather rapidly. The value of the uplands for farming purposes is now beginning to be appreciated and they are being bought and settled upon to a considerable extent, especially near Georgetown and Andrews, where large tracts have been divided into small farms and thrown upon the market. In the county is an abundance of very desirable land, suitable for general farming and in many instances for a variety of special crops. The Coxville fine sandy loam, which occupies 24.3 per cent of the entire area of the county, offers exceptional opportunities. It is of suitable texture for the production of a great variety of crops, and level enough to

permit the use of all kinds of improved implements and machinery. The only trouble is lack of drainage, and this can be supplied at a very reasonable cost. To be more specific, the land can be bought for $5 to $15 an acre; $5 to $10 should clear it of stumps ready for the plow, and the necessary ditching should not cost more than $5 to $20 an acre. So, at a minimum of $20 and a maximum of $45, it can be bought, drained, and put under cultivation, and according to land valuations in other sections of the State it should then be worth $75 to $100 an acre.

The chief item in clearing is the removing of the longleaf pine stumps and scattering trees. In many places there is more than enough timber on the land to pay for the clearing. The other members of the Coxville and Scranton series also are susceptible of being made valuable lands at a reasonable cost, as well as the wetter soils of the Portsmouth series. The light Norfolk soils, naturally fairly well drained, are particularly adapted to certain kinds of early truck crops. The sandy loam and fine sandy loam of the series are also good tobacco, trucking, and fruit soils. The Scranton sand and fine sand are good trucking soils; the Coxville sandy loam and fine sandy loam are very desirable for both trucking and general farming, and the Coxville clay loam and clay will make good grass and pasture land. The large Portsmouth areas offer opportunities to grow rice after the plan now pursued in Louisiana and Texas, while the other areas can be used for corn, forage crops, and a number of special crops. The old rice land, too, though now worth only a nominal sum, can be converted into the best of land for corn and forage crops. By repairing the dikes, cleaning out and deepening the ditches, and installing pumping plants to remove the drainage waters, the water table could be kept from 2 to 3 feet below the surface. Then the soil would become firm enough to support horses and the necessary implements to cultivate and gather the crops. With good drainage established these lands should be about as valuable for corn and forage crops as they were in earlier days for rice.

Drainage is the one great problem in the development of Georgetown County. Not only is it necessary to insure successful agriculture on a very large proportion of the lands, but by it the section would be relieved to a very large extent of mosquitoes and the malaria which certain species of them spread. The Norfolk types can be farmed successfully without any artificial drainage, except in local swales or depressions and where they grade into the flatter Coxville and Portsmouth soils. In such places ditching would prove beneficial. A small acreage of the Coxville sandy loam and fine sandy loam are fairly well drained naturally and in places are farmed quite successfully. Aside from such areas all of the Coxville soils need to be drained artificially. They form most of the true longleaf pine flat-

woods, which are not swampy but which have the water table within 6 inches to 2 feet of the surface, the average being about 1½ feet. No kind of agriculture is practicable on the Portsmouth soils without drainage, as they are in a condition of true swamp in most places, and the Kalmia silt loam is low, flat, and inadequately drained. A topographic map of the county would show that practically all of the uplands are high enough above sea level and the nearby streams to be effectually drained. If the streams already developed were cleared out, deepened, and extended so as to reach all sections the water would rapidly drain away. From an elevation of 5 to 10 feet above tide at Georgetown there is a rise of something like 2 feet to the mile westward, and the river bottoms are almost at sea level to beyond the western boundary of the county. It will be noticed on the accompanying map that the large bays, which by some are thought to be below sea level, are at the heads of the creeks and their elevations range anywhere from 5 to 30 feet above the rivers.

The problem of drainage is so extensive that it may not be handled by individuals, except where the lands lie adjacent to a stream. The owners should vote their lands into large drainage projects or districts, each to bear his proportionate share of the expenses according to the benefits received. To get efficient drainage the main canals should be 7 feet or more deep—that is, below the level of the uplands—the larger laterals anywhere from 4 to 7 feet deep, and the smaller laterals from 2½ to 5 feet deep. A great deal of the ditching can be done very rapidly and at a very low cost by use of ditching machines.

After the lands are drained and put under cultivation there will be other problems to solve—how to keep the soils in a productive state, what kinds and how much fertilizer could be used to advantage upon the different soils and upon the same soil for different crops, and what systems of cropping and farm management should be followed. Except in a very general way it is not possible to foretell the fertilizer requirements. In general, though, it may be laid down as a rule that all of the lands now in a poorly drained condition will be greatly benefited by lime, and a liberal application should be made when the land is being prepared for the first crop. While not so apparent at first, it will be found also that the soils respond generously to the three main elements of plant food—phosphorus, potash, and nitrogen. With cotton it is not best to use much nitrogen on account of the tendency of the plants to go too much to weed and fruit scatteringly, although heavy applications of acid phosphate will prove very beneficial. All of the wet soils carry an abundance of organic matter, but this will disappear rapidly after good drainage has been established unless proper attention is given to the rotation of crops.

It is much better to conserve the supply than to try to replenish it after it has been depleted. No soil deficient in humus will come near its productive capacity in any line of farming, humus being a prime requisite in soil productiveness.

The methods of farming in the uplands are undergoing a gradual change for the better, although not along lines conducive of the most profitable returns. Nearly all of the preparation of the land and after-cultivation is done with light one-horse plows, and little or no attention is given to the rotation of crops or to the adaptability of the different soils to different crops. The land is usually planted continuously to cotton or corn for a number of years, and as a result the soil becomes depleted of organic matter and the yields diminish accordingly. Instead of keeping the soil productive by supplying organic matter and by crop rotation, commercial fertilizers are coming more and more into general use. This is clearly shown in the census reports. In 1889 the amount paid for fertilizers was $3,341, while in 1899 the amount for the same purpose was $8,670. The use of fertilizers has been so haphazard that very little knowledge has been gained of the manurial requirements of the different soils.

In the further development of the county it is expected that general farming, with cotton, corn, oats, and cowpeas as the main crops, will be followed by a very large majority of the farmers, but excellent opportunities are afforded for the development of a number of special industries. Early trucking can be practiced to advantage on a number of the soils, wherever the transportation facilities will permit. Several acres are already in strawberries near Andrews, which are doing exceptionally well. In Horry County, where strawberry growing has been gone into extensively, it has been found that the Klondyke variety, a very large berry, does best on the Coxville fine sandy loam, while the Lady Thomson, another popular variety, does best on the Norfolk sandy loam and fine sandy loam. Celery, medium early cabbage, Irish potatoes, and onions are some of the promising crops for the lighter textured Portsmouth soils. A great variety of vegetables can be grown on the lighter Coxville and the Norfolk soils. Asparagus should prove well adapted to the Norfolk sandy loam, fine sandy loam, and the best areas of the sand. In the line of fruits good peaches, for home use at least, can be grown on the Norfolk types and the Orangeburg fine sandy loam. Pears do well on almost any well-drained land except the deepest sand, and figs and grapes thrive. Tobacco can be grown profitably on the Coxville fine sandy loam, Norfolk sandy loam, and Norfolk fine sandy loam.

The land of the county is held mostly in large tracts ranging up to several thousand acres in extent. A great deal of it is held by

a lumber company at Georgetown, having been bought for the timber it supported. Nearly all of the old rice plantations are large, but the general run of the farms through the uplands is rather small. According to the census reports the average size of farms in 1899 was 187.7 acres, and 63.2 per cent were operated by the owners.

A much smaller percentage of the land is rented, or share cropped, than in any of the better developed counties farther inland. The chief methods of renting lands is for a stipulated amount in cash or lint cotton for a one-horse, two-horse, or larger farm, as the case may be, allowing from 20 to 30 acres of cultivable land to the horse. Cash rent ranges from $1 to $4 an acre, and where cotton is taken the rate is from one bale to three bales for each one-horse farm.

There is an abundance of negro labor in the county. Constituting over four-fifths of the total population, and owning very little land, the majority of them are available for hire. By the day, laborers receive from 50 to 75 cents, and by the month from $10 to $15, with a stipulated amount of supplies and a house furnished. Some pay only a part of the wages in cash, and give a few acres of land to each hand, to be tended along with the other crops. What is particularly needed for the best development of the county is the increase of small farms operated by the owners. Nothing retards agricultural development more than the holding of land in large tracts.

Owing to the general rise in land values everywhere through the South and the recent agitation looking toward the development of the region, land in Georgetown County is gradually advancing in price and will continue to rise for some time to come. Areas of the Coxville fine sandy loam, Norfolk sandy loam, and Norfolk fine sandy loam now in a good state of cultivation are valued as high as $25 to $50 an acre. Uncleared they are worth anywhere from $5 to $20 an acre. The Coxville clay loam and clay may be bought for $2 to $5 an acre, and the Portsmouth soils have only a low value, and this for the timber they support. Sandhill has scarcely any value and the Norfolk sand usually commands less than $10 an acre. As previously stated, the old rice lands can be bought at almost any price below $20 an acre. On the whole, land values are very reasonable. In general unimproved land can be bought, cleared, and drained ready for cultivation at not more than half what it would be worth under cultivation.

SOILS.

South Carolina embraces three great physiographic divisions differing considerably in surface features and in the character and origin of the soils. These are (1) the Mountain region of the western part of the State, a small part of the eastern border of the Blue

Ridge region which is included within the State's boundary line; (2) the Piedmont Plateau region, predominantly rolling and hilly with soils that have been derived through decay from the underlying igneous and metamorphic rocks; (3) the Coastal Plain or "low country," which occurs in the eastern part of the State. The topography of the latter section averages much less rolling than that of the Piedmont region, varying from flat to gently rolling, and the soils represent unconsolidated material that was deposited in an ancient sea. These sediments, derived largely from the mountains and Piedmont Plateau, were deposited under varying conditions, so that distinct formations were brought about, overlying one another in a more or less horizontal way. Since the recession of the ocean, these deposits have undergone considerable change through processes of weathering, including the action of water, air, and vegetation.

The first two regions include the soils of the Piedmont Plateau soil province, the third includes those of the Coastal Plain province, while a fourth soil province is included in the alluvial deposits occurring in all the physiographic divisions. The botton lands formed by these alluvial deposits are found as relatively narrow strips along all of the important streams. The soils of these bottoms represent material washed from all the soils of the drainage basins and deposited in time of overflow.

Georgetown County lies in the lower, seaward portion of the Coastal Plain, and represents in its upland soils the most recently exposed of the marine formations. The surface of this low, Coastal Plain country is flat, and drainage is not so generally developed as in the higher portions of the Coastal Plain, which is somewhat more rolling in topography. There are relatively small areas in Georgetown County, however, that occur in situations favoring good drainage, and here soils have been formed that correspond with the extensively developed soils in the upper Coastal Plain.

This lower Coastal Plain country is included in the "flat-woods" section, the common name of the low coast country of the South Atlantic States.

Bottom lands are quite extensively developed along the streams in Georgetown County. They are very distinct from the uplands, occupying the low, flat areas largely subject to overflow. The material consists of sediments washed down from the mountain, Piedmont, and Coastal Plain regions. Some of the smaller streams reaching through the uplands are bordered by material largely of local origin. The steam-bottom soils grade into the Tidal marsh, which is daily inundated by salt-water tides.

In the uplands there is a variation from poorly drained, flat soils, that probably have been changed little since the recession of the sea, to well-drained soils occurring in slightly elevated situations near

the bluff lines bordering the stream bottoms, where the good drainage and consequent oxidation have changed considerably the character of the material. The wind has altered the surface configuration of much of the area of sandy soils.

There is a belt of sandy material crossing the northwestern corner of the county, which possibly represents an old beach line that has been more or less flattened out by the action of wind. There is also a ridge of sandy soil running through the western part of the county, which practically parallels the present sandy coast ridge. It seems that Sandy Island, in the northeastern corner of the county, lying between the Waccamaw and the Pee Dee Rivers, was deposited as a sandbar, and was subsequently drifted into its present topographic form by the winds.

The upland soils have been divided into series, those having similar color and structural properties and drainage conditions having been thrown together. The Orangeburg series is developed in narrow strips bordering stream bottoms, where the drainage has been good and the oxidation more complete than in the adjacent flat lands having poor drainage. With this thorough drainage and oxidation the soil material has assumed a gray color and the subsoil a brick-red color and friable structure. Only the fine sandy loam member of this series was recognized. The Orangeburg soils are extensively developed in the higher Coastal Plain region of South Carolina, lying to the west of Georgetown County.

The Norfolk series includes level to undulating, well-drained areas of gray soils, with yellow to yellowish-brown sandy clay and sand subsoils. Areas having the yellow clay within the 3-foot section are confined mostly to level or gently sloping situations along the edge of stream bottoms. The deeper sandy members of the series occur both near the bluff lines between the uplands and the stream bottoms and in level to irregularly elevated areas back from the streams, including the ridges previously referred to as possibly representing old beach lines. The light-gray to almost white deep sandy areas that are practically worthless for agricultural purposes have been classed as Sandhill. Other areas where the depth to clay exceeds 3 feet constitute the sand members of the series, including coarse sand, sand, and fine sand, while those with clay nearer to the surface were mapped as sandy loam or fine sandy loam, depending upon the texture of the soil material.

The Coxville series, which is typically developed over the extensive flat areas lying between the sandy soils, is characterized by the dark-gray to black color of its soils and its clay subsoils, of a mottled yellow, gray, and bright red color, and usually plastic structure. On account of the flat surface the drainage is imperfectly established and water frequently stands after rains, the subsoils remaining in a soggy condition throughout the year. The series includes the sandy

loam, fine sandy loam, clay loam, and clay members. The fine sandy loam occupies 24.3 per cent of the total area of the county.

The Portsmouth series includes soils existing under poorer drainage conditions than obtain in the Coxville soils. It is developed in depressed swampy areas in the uplands, such as "bays" and "swamps," where the very poor drainage favors the accumulation of large quantities of organic matter, giving a rather mucky surface soil. The subsoils vary from gray to gray mottled with bluish, yellowish, and brownish colors. The Portsmouth soils are associated with both the Norfolk and Coxville soils, the Coxville series representing an intermediate position, with respect to drainage, between the Portsmouth and Norfolk. The fine sand, sandy loam, fine sandy loam, loam, and clay members of the series are developed.

Another series, the Scranton, is characterized by the black color of its soils and yellow color of its subsoils. These soils also are developed in a position intermediate between the Portsmouth and Norfolk with respect to drainage conditions. The soil of the Scranton series resembles that of the Portsmouth, while the subsoil resembles that of the Norfolk. The sand and fine sand members of the series were recognized.

In the southwestern part of the county there is a small area of Kalmia silt loam, developed on a second bottom or terrace of the Santee River. The material is alluvial in origin, and was deposited by the Santee River before its channel had cut to the present level.

In the stream bottoms three soil divisions were recognized, as follows: First, the Congaree clay along the bottoms near the western edge of the county, where the soil is frequently overflowed by fresh water during freshets; second, the Georgetown clay, occurring nearer the coast, where the soil is daily inundated by the fresh water of the streams lifted under the influence of tides; and third, Swamp, including the variable soil material developed in narrow strips along many streams where the poor drainage has favored the accumulation of organic matter, bringing about a condition somewhat similar to that obtaining in the Portsmouth series.

The areas of Tidal marsh occurring near the coast are daily covered by salt-water tides. This type lies so low that the material remains in a permanently saturated condition. It is only slightly elevated above low tide. In time this Tidal marsh may possibly be lifted above tidal influence, under which condition it seems likely that the material would weather out eventually to give rise to soils like the Portsmouth or Coxville series.

There is a narrow strip of sandy material occurring along the immediate seacoast. This has been given the name Coastal beach, but includes a slight ridge of sand that has been blown above the in-

fluence of the waves. It is this sandy soil which corresponds in a way with the sandy inland ridges.

The names and extent of the several soils are given in the following table:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Coxville fine sandy loam	125,888	24.3	Portsmouth clay	11,008	2.1
Norfolk fine sand	56,960	11.0	Portsmouth fine sand	9,920	1.9
Georgetown clay	53,120	10.3	Coastal beach	7,104	1.4
Congaree clay	31,936	6.2	Coxville clay	6,720	1.3
Swamp	28,736	5.6	Portsmouth fine sandy loam	6,272	1.2
Scranton fine sand	27,008	5.2	Sandhill	4,992	1.0
Portsmouth loam	25,792	5.0	Norfolk sandy loam	3,776	.7
Norfolk sand	23,552	4.6	Portsmouth sandy loam	2,176	.4
Coxville clay loam	21,568	4.2	Kalmia silt loam	2,112	.4
Tidal marsh	20,544	3.9	Orangeburg fine sandy loam	1,088	.2
Norfolk fine sandy loam	15,936	3.1	Norfolk coarse sand	704	.1
Scranton sand	15,872	3.1			
Coxville sandy loam	14,336	2.8	Total	517,120	

NORFOLK COARSE SAND.

The soil of the Norfolk coarse sand to a depth of 4 to 6 inches is a brownish-gray loose to slightly loamy coarse sand, the grains of which are all well rounded. Underlying this is a similar coarse sand of a yellowish-brown color. The soil is somewhat loamy and has a slightly darker color in the timbered areas, but where it has been cleared for some years and deprived by cultivation of the small amount of organic matter it originally contained it becomes lighter in color and, like the subsoil, more incoherent.

There are two areas of the type in the southern part of the county, one of some 300 acres at Dawhoo Lake and the other, containing less than 20 acres, at the landing north of Leneuds Ferry. Other areas are found about 2 miles northeast of Pea House Ferry, at Potato Ferry, and extending along the Gapway road where it crosses Gapway Bay. The areas northeast of Pea House Ferry and along the Gapway road represent old beaches. The surface features are level to gently undulating and the natural drainage is perfect. The position of these areas and their intermediate elevation between the river swamp and the main uplands indicate that they were deposited as sandbars by the Santee River when it flowed at a higher level. By subsequent wind action and the small amount of erosion that has gone on the present surface configuration was produced. A noticeable feature of the type is that although the sand is of a highly siliceous nature it carries enough iron-bearing minerals to give a more pronounced brownish cast to both the soil and subsoil than characterizes the other sands of the Norfolk series.

The original growth varies from a mixture of live and white oaks, hickory, and dogwood on the higher ridges to oak, shortleaf pine, dogwood, etc., back from the edge of the swamp in the more nearly level areas.

Cultivation of the type is confined to the small area north of Leneuds Ferry and a part of an old field at Dawhoo Lake which was cleared years ago. The yields for the first few years, while the soil contains considerable organic matter, are fairly good, but with the depletion of the organic matter there is a corresponding decline in the yields to a point where they are no longer profitable. The open, porous character of the soil makes it entirely too droughty for such crops as cotton, corn, and many others requiring the whole summer season to mature, unless liberal additions of vegetable matter and complete fertilizers are made. On the other hand, it possibly could be handled to good advantage by planting to pecans and peaches, although the orchards would require careful treatment. Early vegetables could be successfully grown with heavy applications of barnyard manure or high-grade complete fertilizers.

NORFOLK SAND.

The Norfolk sand is a light, incoherent to slightly loamy sand of medium texture extending to a depth of 3 to 10 feet. The surface 4 to 6 inches, which contain a small quantity of organic matter, are light gray to gray in color, while the underlying material is yellow to light yellowish brown. In the deeper phases of the type the soil, as a rule consisting of almost pure quartz sand, is very light in color, incoherent and droughty, but in the flatter areas, where the depth to clay ranges from 3 to 5 feet, it is somewhat loamy and fairly retentive of moisture.

The Norfolk sand occurs in areas of considerable extent to the east of the Waccamaw River, and in a number of smaller areas, mostly along the south shore of Winyah Bay and bordering the Santee River. Extending along the tidal marshes from Midway Inlet nearly to the Horry County line is a narrow strip of land, mapped as the Norfolk sand, which is somewhat different from the general run of the type. The soil here is a brownish-gray medium-textured sand with a depth of 4 to 6 inches, underlain to a depth of 3 feet or more by a light-brownish to yellowish-brown sand.

The surface features are level to very gently undulating, as in the case of the brown phase just described, and level to undulating and gently rolling in all other areas. The elevation of the type, its open structure, and deep, sandy nature insure good natural drainage.

The area at Choppee and the one lying between Carvers and Tupelo Bays are parts of an old beach ridge with an elevation of 6 to 10 feet above the adjoining Coxville, Scranton, and Portsmouth types.

The other areas are parts of old sand plains that have been modified to some extent by erosion and wind action. The areas along the bay front especially are broken by frequent small streams cutting back into the highlands. In addition to the irregularities thus produced the winds have heaped the sands up in places, forming small hillocks or ridges. Back from the bay the surface features gradually become more level and the type grades off into the extensive flat areas of the Scranton sand.

The Norfolk sand supports quite a mixed growth of timber. On the higher-lying areas overlooking Winyah Bay and the river lands live oak constitutes the principal growth. Areas inclined toward the condition of true Sandhill support a scattering growth of post oak and blackjack oak and scrubby longleaf pine, while those approaching the Scranton sand in character have a good growth of longleaf pine.

Only a small proportion of the type has been cleared and brought under cultivation. Many of the old rice-plantation homes were built on the Norfolk sand on account of its higher, better drained position, but at the time it was not used extensively for farming purposes. Small areas were brought under cultivation, however, being used principally for corn, sweet potatoes, and vegetables for home consumption. With the practical abandonment of the rice industry the majority of the homes were deserted, and with them the land was thrown out of cultivation. Now cultivation is confined mostly to small patches farmed by negro tenants. Cotton and corn give very light yields. The average yield of corn is not more than 10 bushels and of cotton one-fourth bale per acre. Some areas of the brown phase, which is considered better than the general run of the type, are being used quite successfully in growing vegetables for shipping and canning.

The Norfolk sand is too light and droughty to be used for the general crops of the section, although by very careful management and making heavy applications of fertilizers and stable manure it can be made to produce good crops of cotton, corn, sorghum, etc. Its best uses are for growing watermelons, sweet potatoes, and a variety of early vegetables for the northern markets. In addition to beans, peas, Irish potatoes, cabbage, and okra, it can be made to produce good crops of asparagus of excellent quality, and this is a very profitable crop.

NORFOLK FINE SAND.

The Norfolk fine sand, to a depth of 4 to 6 inches, consists of a gray incoherent to light loamy fine sand. In the cultivated areas the soil is quite light in color and compacts to some extent on account of the depletion of the organic matter, while in the timbered areas it is somewhat loamy and darker in color. The subsoil to a depth of

3 feet or more is a pale yellow to light yellowish brown incoherent to slightly loamy fine sand. Generally the gray color of the soil changes abruptly to pale yellow, which at depths of 15 to 25 inches becomes light yellowish brown. The sandy material is underlain at depths of 3 to 8 feet by a sandy clay. The Norfolk fine sand is an easy type to handle but a hard one to keep in a productive state. With a good supply of humus the soil is fairly retentive of moisture, and crops do not suffer unduly from drought, but when this is depleted, as in most cultivated areas, it becomes correspondingly more droughty and less productive, and its capacity for holding mineral fertilizers is materially reduced.

The Norfolk fine sand occupies low, level to gently undulating and rolling ridges, and broader areas with a somewhat irregular topography. The natural drainage is good, except in narrow strips at the base of some of the slopes, which are affected by seepage, and in small depressions which have no outlet. These areas would be benefited by providing open ditches or tile drains. The largest areas are found in the western part of the county, occupying the best drained portions of old beach ridges. An area of considerable extent occurs along the Horry County line east of the Waccamaw River and some others to the south of Georgetown bordering Winyah Bay and the Sampit River.

The original growth on the type consisted very largely of longleaf pine. About all of this has been removed, and cut-over lands now have a scattering growth of pine and scrub oaks, or in some places a new crop of longleaf pine has sprung up and is rapidly taking possession. Immediately along the bay front, where the drainage is excessive and the sand deep, the pine gives way to some very picturesque groves of live oak, these having been used for building sites by the rice planters.

Cultivation of the Norfolk fine sand is confined very largely to the northwestern part of the county, where a number of small farms are located on it. Cotton and corn are the only crops grown to any extent and these almost invariably give light yields. A few farmers, by heavy application of fertilizers and some attention to the rotation of crops, find it possible to produce one-half to three-fourths of a bale of cotton and as much as 25 bushels of corn to the acre on this type. With the majority practicing the cruder methods of the section the yield of cotton is less than one-half bale and corn from about 7 to 15 bushels per acre. The type is too light and sandy for general farming purposes, but it is well adapted to some lines of special farming, including the growing of a variety of early vegetables for the northern markets. The best areas will produce profitable crops of asparagus, as well as a good quality of early peaches, and possibly will grow good pecans and figs. In the tobacco sections of the

State and of North Carolina it is used to some extent for growing bright leaf tobacco, and usually the quality is good, although the yields are light. Peanuts[1] will give good results with moderate fertilization. The poorest areas should be allowed to reforest themselves with pine.

For all lines of farming it is highly important that the soil be kept liberally supplied with humus. This can best be done by growing crops of cowpeas, vetch, and other legumes in some definite system of rotation. Complete fertilizers will be required unless barnyard manure can be secured. Mixtures analyzing about 6–3–4 have been profitably used on this soil in various portions of the coastal plain for a number of crops, particularly cotton and corn. For sweet potatoes, Irish potatoes, and a number of vegetables probably 6 to 8 per cent of potash should be used in the mixtures.

NORFOLK SANDY LOAM.

The Norfolk sandy loam, to a depth of about 12 to 20 inches, consists of a gray to yellowish loamy sand or light sandy loam. This rests upon a yellow to yellowish-brown, light, friable sandy clay subsoil. The surface 4 to 6 inches constituting the soil proper is characterized by some shade of gray, varying from very light in the older cultivated fields depleted of organic matter to rather dark in newly cleared and timbered areas; while the underlying material is yellow to light yellowish brown in color and usually less coherent than the soil to within a few inches of the clay, where it is heavier. The clay, to a depth of $2\frac{1}{2}$ to 3 feet, or even deeper in places, is quite friable, yellow to yellowish brown in color, and not much mottled. At greater depths it becomes more compact and the yellowish cast gives way largely to a gray, mottled to a greater or less extent with light brown and reddish colors.

The Norfolk sandy loam has a very limited development in Georgetown County, although at higher elevations through the Coastal Plain region of the State it is one of the most extensive types and very important agriculturally. It is level to gently sloping in topography and occurs mainly along the edge of the river swamps. The largest areas are found in the southwestern part of the county, extending along the swamps of Cedar Creek and the Santee River; just to the north of Black River at Potato Ferry Bridge, and to the north of Georgetown as far up the Pee Dee River as Prince Frederick Chapel. About 5 miles west of Georgetown is a small area bordering Ports Creek, and two others are found near Sampit.

The original timber, consisting of a heavy growth of longleaf pine, has been about all removed, and approximately half the type is now in the condition of cut-over land, the other half being under cultivation. Cotton and corn are the main crops, with small

[1] Farmers' Bulletin No. 356, Peanuts.

patches devoted to sorghum, sweet potatoes, oats, etc., for home use. The yields of both cotton and corn are quite variable and as a rule not nearly what they would be under more intensive methods. Small areas have been made to produce as much as three-fourths of a bale of cotton and 50 bushels of corn per acre, but the ordinary yields of these crops are less than a half bale of the former and from 10 to 20 bushels of the latter. The yields of the other crops grown are proportionately low, owing to a large extent to the careless methods of handling the soil. Instead of thorough tillage and cultivation and the rotation of crops as a means of keeping the soil in a productive state, commercial fertilizers are extensively used for this purpose and the results generally are disappointing. What the type needs most of all is to be kept well supplied with organic matter, and this can best be done by applying stable manure and growing cowpeas and other leguminous crops as often as possible in some well-planned rotation. When this is done the use of fertilizers will not be dispensed with, but, on the other hand, will be attended by more profitable returns than when the soil is depleted of organic matter. It has been noted that cotton has a tendency to go too much to weed; that is, that it does not bear enough fruit for the size of the stalk. This trouble possibly could be overcome, partly at least, by applying liberal quantities of phosphatic fertilizers and not so much nitrogen.

While not used for any special crops, there are a number to which it is especially adapted. It ranks with the Norfolk fine sandy loam as the best soil in the South Atlantic States for the production of bright yellow tobacco. It is the type so extensively used in the Puddings Swamp tobacco district of Clarendon and Florence Counties. Peanuts do well and could be profitably grown between corn as a forage crop for hogs. Of the truck crops it is well adapted to watermelons, cantaloupes, cabbage, asparagus, peas, beans, lettuce, sweet and Irish potatoes, and strawberries. The Lady Thompson strawberry and possibly some other early varieties will do well. In some sections the type is also being used quite successfully in growing early varieties of peaches for the northern markets. It offers good opportunities in many lines of farming and not only possesses the advantage of nearly level topography, fairly good natural drainage, and easy tillage, but can by careful management be kept in a high state of productiveness. What can be done with the type in the line of general farming has been shown in some of the farm demonstration work of the Department of Agriculture, where it has been made to produce over 100 bushels of corn and as much as 2 bales of cotton per acre.

NORFOLK FINE SANDY LOAM.

The soil of the Norfolk fine sandy loam, with an average depth of 6 inches, is a gray loamy fine sand to light fine sandy loam.

Underlying this is a pale yellowish-brown fine sandy loam or in some places a yellowish fine sand, which at a depth of 15 to 24 inches grades into a light yellowish-brown friable fine sandy clay. The type occurs in two phases, and between the two are several gradational variations. The deeper phase may be considered as typical, as it occurs over extensive areas in the State farther inland. It consists of 4 to 6 inches of a medium gray or light-gray loamy fine sand, underlain to a depth of 18 to 24 inches by a yellow sand of similar texture, and this in turn by a yellow light friable fine sandy clay with very little mottling. The other phase is intermediate between the deeper sandy areas and the lighter better drained areas of the Coxville fine sandy loam. Here the soil is a gray to dark-gray light fine sandy loam to a depth of 4 to 6 inches resting upon a yellowish fine sandy loam, grading downward into a yellowish-brown fine sandy clay, which below 15 to 18 inches is sometimes faintly mottled with reddish colors. The mottling of the clay is not pronounced within 3 feet of the surface, but becomes more so at greater depths, light brown and red colors predominating. The clay is somewhat heavier and more compact in its properties than that of the typical areas. The soil is easily tilled and can be kept in a high state of productiveness, but unless handled carefully it soon deteriorates. In nearly all of the older cultivated areas it is deficient in organic matter, and for that reason very light in color.

The Norfolk fine sandy loam is not an extensive type, but occurs widely distributed over the county in a number of small areas. It occupies level to gently undulating well-drained strips along the edge of the river swamps, narrow gentle slopes along the small streams, the points of highland at the junction of some of the creeks, and slightly elevated ridges and irregular bodies scattered through the Coxville type. The lighter phase of the type is confined largely to the areas bordering the Pee Dee and Waccamaw Rivers and Black River as far west as Pringles Ferry, and to those in the western part of the county associated with the Norfolk fine sand. The others are mostly of the heavy phase. The natural drainage is good, except in narrow marginal areas grading off into wet Portsmouth or Coxville soils and in small shallow depressions. Areas not properly drained would be benefited by providing open ditches, which can be constructed very cheaply, or by laying systems of tile drains.

The Norfolk fine sandy loam is derived from the lighter phases of the Columbia formation, where the sandy material is fine and the depth to clay does not exceed 3 feet. Like the Norfolk sandy loam, it was heavily timbered with longleaf pine in its native state, but about all of this has been cut for lumber or killed by forest fires following turpentining. A scrubby growth of post oak and blackjack oak is gradually taking possession of some of the cut-over lands.

A large proportion of the type is still uncleared and awaits development. The areas under cultivation are devoted principally to cotton and corn, and in a more limited way to oats, sorghum, cowpeas, sweet potatoes, and vegetables for home use. The ordinary yield of cotton is less than one-half of a bale and of corn from 10 to 20 bushels per acre. With good management it can easily be made to produce a bale of cotton and 50 bushels or more of corn per acre. Commercial fertilizers are always applied to cotton fields, and their use is becoming more general for corn and other crops. The chief problem in handling this soil is to keep it well supplied with organic matter. By this means it would become mellow, much more retentive of moisture, and the fertilizer used would give much more satisfactory returns. Systematic rotation of crops, to keep the ground occupied as nearly all the time as possible, should be practiced. Cowpeas, vetch, and other legumes should play an important part in such rotations.

Aside from the general crops which can be grown very successfully, the Norfolk fine sandy loam is especially adapted to early trucking and the growing of bright leaf tobacco, peanuts, pecans, early peaches, and figs. At Andrews is a large field of strawberries doing exceptionally well, and other tracts nearer Georgetown are now (spring, 1911) being brought under cultivation for this crop. It is well adapted to watermelons, cantaloupes, Irish potatoes, and a variety of early vegetables, including cabbage, lettuce, carrots, beets, radishes, cucumbers, tomatoes, okra, peas, beans, asparagus, and several others.

SANDHILL.

The Sandhill is a light-gray, pale-yellowish, or white sand, consisting of almost pure quartz and ranging in depth from 6 to 30 feet. In places it is fine, but more generally it is medium to coarse in texture. The surface 3 to 6 inches, corresponding to the soil, contains scarcely any organic matter. For that reason the surface is very light gray in color, or if devoid of vegetation, as is the case in many places, it is almost a pure white. Generally the areas appearing white at the surface have a subsurface layer of a few inches, which is slightly tinged with organic matter. At greater depths the sand is very incoherent and pale yellow to bleached white in color.

The Sandhill represents the extreme condition of sandiness in the county. In its shallower phases it approaches the character of the Norfolk sand types, and in places where it is deepest it is little else than a straight dunesand now being drifted about by the winds. The surface features range from nearly level to irregular, undulating, hillocky, and duny, and the natural drainage, accomplished almost entirely by seepage, is excessive. The largest area occupies all of Sandy Island between the Pee Dee and Waccamaw Rivers at the

northern end of the county. Two other areas occur near Pea House Ferry, one east of the ferry and the other on the west side of Black River southwest of the ferry. A small area is found 2 miles northeast of Pea House Ferry.

The origin of Sandhill is from beach and river deposits modified by erosion and wind action. Sandy Island was deposited by the Pee Dee River as a sandbar or sand plain when it flowed at a higher level, the present configuration resulting from subsequent action of the wind, the surface being irregular and duny.

The original timber, where still standing, consists of a scattering growth of pine and scrubby oaks.

Farming this type has proved very unsuccessful, except in small, loamy depressions, which are not typical. It is not suited to agriculture, and should be allowed to remain in forest, or, if treeless, reforestation with longleaf pine should be encouraged.

ORANGEBURG FINE SANDY LOAM.

The soil of the Orangeburg fine sandy loam to a depth of 4 to 6 inches is a gray, fine sand to slightly brownwish, light, fine sandy loam, grading below into a yellow fine sand or light yellowish brown fine sandy loam. At a depth of 8 to 15 inches the sandy mantle gives way abruptly to a friable, brick-red fine sandy clay. This to a depth of 3 to 5 feet is very uniform in color and texture, or perhaps increases gradually in compactness to a depth of 2 to 2½ feet. At greater depths it becomes rather more plastic and mottled with red and gray, like the deeper subsoil of the Coxville fine sandy loam. Where the depth to clay is greatest the overlying material is little else than a pure sand, rendered somewhat loamy at the surface by the presence of a small quantity of organic matter, and from this extreme it varies to a true fine sandy loam in the areas with clay within 8 to 10 inches of the surface. The loamier areas are the more desirable for farming, because they are naturally more productive, and can be kept in a high state of cultivation at less expense.

This type has a very small extent in Georgetown County, where it occurs only along the edges of swamps. It occupies either the entire narrow slope or a narrow strip at the brow of the slope along the smaller streams and level to gently undulating areas along the edge of the larger river swamps. Two of the most extensive areas mapped are found in the southern part of the county, one near the southwestern corner and the other about 6 miles south of Sampit. One small area borders the Pee Dee River swamp 2 miles north of Prince Frederick Chapel, another lies along Black River swamp some 9 miles northwest of Georgetown, and still others border Whites Creek and Sampit River west of Georgetown, the small creeks between Georgetown and Skinners Ferry and the Black River road crossing on Six Mile Creek.

The Orangeburg fine sandy loam, as it occurs most extensively through the State and other sections of the Coastal Plain region, is derived from sands and clays of the Lafayette formation. Here it seems to be derived from the Columbia formation, and owes its differentiation from the flat Coxville fine sandy loam to more thorough drainage. In other words, it is apparently what a large part of the Coxville fine sandy loam would have been under conditions of thorough drainage prevailing over a long period of time. The original growth, now nearly all removed, consisted of longleaf pine on the loamier areas and a mixture of longleaf and pitch pine and oak on the sandier areas.

Except the areas along Whites Creek, which are partly of the sandier phase, the type is largely under cultivation, cotton and corn being the main crops. Cotton yields from one-third to three-fourths of a bale, and corn from 10 to 25 bushels per acre. Under good management this soil should produce a bale or more of cotton and 50 to 75 bushels of corn per acre. Many other crops would do well. It is one of the best peach soils in the South, and will prove well adapted to some other fruits, including pears and grapes. The lightest areas are especially adapted to pecan growing.

SCRANTON SAND.

The soil of the Scranton sand, to a depth of 5 to 8 inches, is a dark-gray to black loamy sand of medium texture. The loamy properties of the soil are due almost entirely to the large quantity of organic matter[1] it contains. The subsoil to a depth of 15 to 18 inches is a sand similar in texture to the soil, but less coherent and gray to drab or yellowish in color. There is an abrupt change from the dark loamy soil into a light-gray or drab sand, which within a few inches grades into a slightly more coherent yellow or yellowish brown sand. At an average depth of about 15 inches a sticky sand is encountered, which may be either gray or yellowish in color and mottled to some extent with bright brown and orange colors. The sandy material is underlain by a gray and red mottled clay at a depth of 3 feet or more.

A phase differing somewhat from the more extensive development of the type includes a portion of the areas on Waccamaw Neck and Cat Island. Here the soil is a dark-gray to black sand as in the typical areas, but immediately underlying this or separated from it by a layer of light sand is a dark-brown layer of a rather compact loamy sand, known by some as hardpan, and below this is a gray or yellowish sand. Whether this dark layer represents what at one time was the surface soil, subsequently covered over, or has formed

[1] A typical sample showed on analysis 3.01 per cent organic matter in the soil and 0.34 per cent in the subsoil.

as the result of poor drainage is not definitely known. The dark color and loaminess is due to a peculiar form of organic matter rather than to an accumulation of iron and would no doubt gradually disappear by oxidation were good drainage conditions established.

The surface of the type is almost level and the drainage imperfect. Little or no water stands on the surface, except for a short time after heavy rains, but the water table is maintained within 1 to 3 feet of the surface the year round.

The original timber consisted of a heavy growth of longleaf pine. Most of this has been removed and broom sedge and other coarse wild grasses have practically taken possession. Scattering clumps of gallberry bushes are found throughout the type. Some of the lighter colored areas, approaching the Norfolk condition, are characterized by a scattering growth of small post oak and roundleaf black-jack oak.

Small areas of the type here and there have been brought under cultivation for cotton, corn, and a few other crops. Little or no attention has been given to the drainage of the soil, and almost without exception the yields are light and uncertain. The type is susceptible of good drainage at a very reasonable cost, and when drained it will become valuable land for a variety of crops. Strawberries, Irish potatoes, cucumbers, peppers, okra, beans, and many other vegetables would do well. It could also be made to grow good crops of corn, cotton, cowpeas, etc., if it were carefully fertilized and systematic rotations practiced.

SCRANTON FINE SAND.

The Scranton fine sand consists of 5 to 8 inches of a dark-gray to black loamy fine sand, underlain by a yellowish-gray to light yellowish brown fine sand, which at a depth of 15 to 18 inches becomes sticky and somewhat mottled with light-brown or orange colors. Generally the yellowish cast increases with depth until the water table is reached, where it becomes more a gray. At a depth of 3 or more feet the sandy material grades into a gray clay mottled with yellow, orange, and red colors.

This type occupies flat areas, with the water table standing 1 to 3 feet from the surface the year round. Large areas occur southwest of Georgetown, east of the Waccamaw River, and scattered through the western half of the county.

The original timber, consisting of a heavy growth of longleaf pine, has nearly all been removed. The present growth consists of scattering longleaf pine, gallberry bushes, and a mat of broom sedge and other coarse wild grasses. In places a scattering growth of scrubby

post and black-jack oaks is found, while in other places a growth of young longleaf pine is rapidly taking possession of the areas.

Small areas of the Scranton fine sand are cleared and farmed to cotton, corn, and a few other crops. As little has been done to improve the drainage, the yields are variable and generally unprofitable. The type needs to be thoroughly drained before any attempt is made to cultivate it. Drained, it will be well adapted to strawberries, cucumbers, Irish potatoes, and a variety of other vegetables, as well as cotton, corn, and some other of the general crops. Pecans would thrive on well-drained areas.

The type can be drained thoroughly at a very reasonable cost and converted into valuable land. In its present condition it is worth scarcely anything.

COXVILLE FINE SANDY LOAM.

The soil of the Coxville fine sandy loam, to a depth of 5 to 7 inches, is a dark-gray to black, smooth-textured, light fine sandy loam, resting upon a gray, drab, or yellowish brown fine sandy loam. This becomes gradually heavier downward, grading into the subsoil proper at a depth of 12 to 16 inches. The subsoil is a friable to rather compact plastic gray to drab fine sandy clay, more or less highly mottled with light-brown and red colors. The upper 6 to 12 inches of the clay may be friable and gray or a variegated gray and yellow with reddish mottlings, but at greater depths it becomes more compact and plastic, and the color is gray highly mottled with red.

Over a very large proportion of the type the soil is black and loamy from the presence of a good supply of organic matter. The lightest-colored areas are the higher lying cut-over lands, frequently burned over, and the fields that have been under cultivation for some time. Small scattering areas of the type have a black soil with light-colored underlying sandy material and a clay subsoil rather tough and plastic in its properties. Another minor phase consists of a dark-gray to black very fine sandy loam soil 4 to 6 inches deep, a drab to yellowish-brown subsurface layer of the same textured material, extending to a depth of 8 to 15 inches, and a rather compact mottled gray and red very fine sandy clay subsoil. Were the latter phase more extensive it would have been shown on the soil map and described as the very fine sandy loam member of the Coxville series. The areas with the heavy clay subsoil would be more difficult to drain than the typical areas, and, principally for that reason, they are less desirable, their crop adaptations being about the same. The very fine sandy loam, while equally as productive as the typical soil, is somewhat harder to drain thoroughly and to keep in good tilth.

The Coxville fine sandy loam is by far the most important type in the county, both in point of extent and the agricultural opportunities

it affords. It occupies 24.3 per cent of the total land area of the county. Through the central part of the county it occurs over large tracts almost to the exclusion of any other type, and in the western part of the county it is extensively developed. Farther east it gives way to the deeper sandy types of the Scranton and Norfolk series, only one small area occurring on the Waccamaw Neck and none to the south of Winyah Bay for a distance of over 10 miles inland. The very fine phase of the type is confined to small areas along the western edge of the county, one extending along the road between Rhems and Mingo Bridge and others between the bridge and Union Church. Immediately along the creeks and smaller drainage ways the type is found occupying very gentle slopes rising to a height of 3 to 10 feet, while in the extensive interstream areas it occupies very level topography, interrupted only here and there by a shallow, meandering swale, through which a part of the surface drainage finds its way slowly to the streams and swamps. The drainage system is immature and the streams sparsely distributed. Very little water is found standing on the surface except for a short time after heavy rains, but over a very large part of the type the water table is maintained within 3 feet of the surface, and areas where it occurs at greater depth are inadequately drained for the best production of crops. The driest areas usually are found at the brow of slopes, where they are easily relieved of their surface water, and have fair underdrainage by seepage along the lower slopes. That the dark color of the soil and the high degree of mottling, as well as the close, clammy properties of the subsoil, are the result of inadequate drainage is easily seen by comparing this with other types. The Norfolk fine sandy loam and the Orangeburg fine sandy loam, with good drainage, have a lighter soil and a more uniformly colored and more friable subsoil. On the other hand, the Coxville fine sandy loam has a greater degree of friability and more color than the swampy Portsmouth types. The tendency with good drainage established will be more and more toward a gray soil, a yellow subsurface layer, and a yellowish-brown to red friable subsoil.

The original forest growth consisted of heavy longleaf pine, all but scattering patches of which has been removed. In the cut-over lands most of the stumps are still standing, and the removal of these forms one of the chief items of expense in clearing the land.

A number of farms are located wholly or partly on the Coxville fine sandy loam, especially in the western part of the county, where it is somewhat more irregular in topography than in the broad expanses farther east. The farms, as a rule, are either located near or along the brow of the slopes where the best natural drainage is secured, or on some of the low ridges lying in the lower areas of Coxville clay loam. Very little of the cultivated land has been drained

artificially, and on the whole the yields are variable and often unsatisfactory. On the poorer-drained areas cotton goes too much to weed, and generally sheds badly from the overabundance of water. Cotton and corn are the main crops. Of the former the yields range from one-fourth to 1 bale, and of the latter from 10 to 40 bushels per acre. At Rhems it is expected to yield something like a bale of cotton and from 25 to 50 bushels of corn per acre, with liberal applications of fertilizer, showing conclusively that the soil is naturally productive and needs only to be drained and handled properly.

It is now being realized by the business men of the county as well as many outside of the county that the Coxville fine sandy loam offers exceptional opportunities for profitable farming in many lines. Within the last year (1910) large tracts of this land just north and west of Georgetown have been bought in by a local company, and as fast as it can be provided with main drainage canals and roads it is being offered in comparatively small tracts to settlers. In this way it is hoped to develop rapidly the so-called back country of Georgetown County. Other extensive improvements also are being made near Andrews, and between Andrews and Lanes in Williamsburg County. Drainage is the one great problem, and this can be provided at a very reasonable cost. With the cost of the land now ranging from $5 to $20 an acre it can be cleared, thoroughly drained with ditches, and put into condition for cultivation at a cost ranging from $10 as the lower limit to $40 as the upper limit, and under cultivation it should easily be worth double the highest cost of development, considering the ruling prices for the less productive though more highly-developed lands of the State.

With good drainage the Coxville fine sandy loam is an easy soil to till and to keep in a productive state. It is especially adapted to cotton, corn, oats, forage crops, sugar cane, and, in fact, to practically all of the general crops of the region. In Horry County the successful growing of the Klondyke strawberry is confined almost entirely to the Coxville fine sandy loam. It is well adapted to strawberries, cucumbers, Irish potatoes, and a variety of other vegetables for early markets. It will yield heavy crops of bright-yellow tobacco, but unless the very best of drainage is provided the quality of the leaf will not be as good as can be secured on the Norfolk sandy loam and Norfolk fine sandy loam.

A liberal application of burnt lime, about 1 ton per acre, should be made when the soil is being prepared for the first crop. In connection with the cotton crop especially, phosphatic fertilizers in liberal quantities will tend to make the plants fruit better.

COXVILLE SANDY LOAM.

The soil of the Coxville sandy loam, to a depth of 4 to 6 inches, is a dark-gray to black light sandy loam, resting upon a gray, drab,

or yellowish sandy loam. This becomes heavier with depth, and at 8 to 12 inches gives way to the subsoil proper, which is a rather tough, plastic sandy clay mottled gray, yellow, and red to a depth of 18 to 24 inches and gray, with pronounced red mottlings, at greater depth. The dark color of the soil is due to the relatively high content of organic matter.

A coarser phase of the type consists of 7 to 9 inches of rather coarse sandy loam, changing from dark gray in the surface 3 or 4 inches to yellowish brown or drab beneath, and underlain by a tough, gritty, gray and red mottled sandy clay.

The Coxville sandy loam is most extensively developed in the southwestern part of the county, although occurring elsewhere in several widely scattered areas. The largest areas are found south of Andrews, bordering Lanes and Choppee Creeks, between Big and Little Kilsock Bays, and north of Georgetown. The coarse phase is confined to a large area between Cedar Branch and Boggy Swamp, a few small areas in this vicinity, and part of the areas bordering Choppee Creek on the west.

The Coxville sandy loam is an upland type of almost perfectly level topography and naturally poor drainage. It lies 2 or 3 feet higher than the Coxville clay or clay loam and occurs at about the same level as the fine sandy loam. It is 5 to 10 feet above the adjoining swampy Portsmouth areas and stream courses and from 10 to 40 feet above sea level. Occupying as it does a part of the extensive pine flats with only a very immature system of sluggish streams, the drainage of practically all areas of the type is inadequate for the successful production of crops. No areas are in a badly waterlogged or swampy condition, but in any of them standing water is found within 3 feet of the surface.

The original growth consisted very largely of longleaf pine. About all of this has been removed and the cut-over lands now have a scattering growth of small post oak and blackjack oak and clumps of gallberry bushes.

Small areas of the type have been brought under cultivation, generally without providing artificial drainage. Corn and cotton, the main crops, give good yields, averaging from 10 to 20 bushels of the former and from one-fourth to two-thirds of a bale of the latter per acre. With good drainage, such as has been provided in a few places, the Coxville sandy loam is well adapted to a variety of general crops, such as peanuts, corn, oats, cotton, cowpeas, velvet beans, soy beans, grasses, and sugar cane, etc. The Klondyke strawberry, which has given such satisfactory results on the Coxville fine sandy loam in Horry County, probably would do well. Cucumbers and a number of other vegetables could be produced for early markets.

The large areas lie along the streams where their drainage should not prove at all difficult and not so very expensive. The smaller areas, on the other hand, situated away from the streams, can be drained profitably only in connection with the more extensive types surrounding them.

COXVILLE CLAY LOAM.

The surface 4 to 5 inches of the Coxville clay loam consist of a black loam to clay loam with a high organic-matter content. Below this is a gray, yellow, and red mottled plastic clay, which extends to a depth of 3 feet or more without much change in texture or in places may give way at a depth of 2 or 3 feet to a coarse, gritty clay. White plastic, impervious, and rather tough, the clay is not as heavy or tough as the subsoil of the Coxville clay, though considerably more so than that of the Coxville fine sandy loam. Yellow and gray are the dominant colors in the upper subsoil, but below a depth of 18 inches a gray of different shades is thickly mottled with orange and red iron stains.

The type occupies almost perfectly flat areas and broad, shallow depressions, known as savannas. It lies from 2 to 4 feet lower than adjoining areas of the Coxville fine sandy loam and as much as 6 feet lower than some of the Norfolk types. All areas are in a poorly-drained condition, with the water table within a foot or so of the surface the year round. The very level topography makes the natural drainage very slow and imperfect and this is aggravated by the impervious underlying clay. The result is that a very large portion of the drainage water must be removed through evaporation.

The Coxville clay loam occurs most extensively in the western part of the county, especially south of Andrews and in a large area to the northwest of Carvers Bay. Other areas occur between Georgetown and Sampit on the north side of the Sampit River and to the south of Sampit along Little Kilsock Bay.

Some of the savanna areas represent a condition of true prairie with broom sedge and other coarse wild grasses as the only growth. The other areas now occurring mostly as cut-over lands originally supported a heavy growth of longleaf pine.

Efforts to cultivate the Coxville clay loam are confined to a few small areas south of Sampit. No attempt to improve the drainage except possibly to run a shallow ditch around the edge of the field. The yields of cotton and corn, the main crops, are not only uncertain, but as a rule anything but satisfactory. In the present undrained condition of the type it is not adapted to any of the crops of the region. Its drainage will be difficult for several reasons, chief among which are its very level surface and the impervious underlying clay. Possibly in view of this fact its best use, for some time to come at

least, will be as pasture. The broom sedge and other wild grasses on it afford fairly good pasturage for a short time in the spring, or until the grass gets too old and tough. A more satisfactory plan would be to provide enough open ditches to keep the water table about 1½ to 2 feet below the surface and then, after clearing the land and putting it in good tilth, to plant Bermuda grass or possibly better still a mixture of Bermuda and Japan clover. The latter will make a luxuriant growth and afford excellent pasturage on any of the heavier soils of the county if the water table is kept a short distance below the surface. Probably the Bermuda grass would grow tall enough to be cut for hay. Even if it did not it would afford good pasturage for all kinds of stock for about 10 months in the year. All areas would be benefited by heavy applications of lime.

With good drainage, which can be accomplished by an extensive system of deep, open ditches, the Coxville clay loam would produce good crops of corn, oats, sugar cane, and grasses. The ditching would be very slow and costly if done by hand, but with ditching machines it could be done at a reasonably low cost per acre; in other words, at a cost that would make it a profitable undertaking.

COXVILLE CLAY.

The Coxville clay consists of about 4 inches of a black heavy loam to heavy clay loam or clay, underlain by a gray, yellow, and red mottled heavy, plastic, impervious clay. From yellow and gray mottled and slightly friable near the surface the subsoil changes rapidly in color below to a bluish gray, streaked and mottled with bright red. The plasticity also increases somewhat to a depth of 24 to 30 inches. Thence to a depth of several feet the material continues about the same in color and texture, or in places it may give way at varying depths below 36 inches to a gray and red mottled tough, gritty clay.

This is the least important type of the Coxville series, although occurring in considerable areas near Andrews and Browns Ferry and southwest of Sampit. It occupies low, level stretches and small, slightly depressed areas through the sandy types of the series. A few small areas, called savannas, represent a true prairie condition, with broom sedge and other coarse wild grasses as about the only vegetation. The other areas support a scattering growth of shortleaf pine, scrubby black gums, water-loving oaks, and clumps of gallberry bushes. There was also an admixture of longleaf pine in the original growth of some areas, but about all of it has been removed for lumber.

On account of the low, level topography and the heavy impervious character of the subsoil, the natural drainage of the type is slow and

imperfect, being effected largely by evaporation from the surface. The water table is found within 1 to 3 feet of the surface the year round. Very little if any water stands on the surface, except during wet seasons.

The Coxville clay is derived from the heaviest phases of the Columbia formation, where partial drainage has been established. Areas of similar texture in a swampy condition are classed as the Portsmouth clay.

No effort has been made to improve the Coxville clay, except in places where it is fenced and used for pasture. Areas not under fence are grazed to some extent by herds of cattle roaming over the commons, and generally where there is much pine turpentining is practiced. It is not likely that much attempt will be made to cultivate the type, at least until all the lighter and more easily drained lands are well settled. The drainage necessary to insure profitable crops would be entirely too expensive, and even with good drainage established handling the soil satisfactorily would prove a difficult problem. On the other hand, it could be converted into good pasture lands at a very reasonable cost. First, it should be provided with a sufficient number of open ditches, deep enough to keep the water table some 2 feet below the surface, then the soil should be plowed a few times to kill off the native grasses and 1,000 to 2,000 pounds of burnt lime per acre applied to sweeten the soil. After this Bermuda grass or Japan clover could be seeded for permanent pastures.

PORTSMOUTH FINE SAND.

The surface 6 to 10 inches of the Portsmouth fine sand is a black, loamy fine sand carrying a very large quantity of organic matter.[1] In places the soil is almost a true muck, with only a small admixture of fine sand, and from this it varies to a soil in which sand is the chief constituent. The sand is naturally very light in color, but this is entirely obscured by the black organic matter. Below the soil to a depth of 2 feet or more is found a light-gray to white fine sand, with very little, if any, coherency. At a depth of 2 feet, or in some areas at 3 or 4 feet, a sticky fine sand is encountered, which usually is tinged with rusty-brown iron stains, and this grades downward rapidly into an impervious plastic clay.

This type occupies depressed swampy areas associated principally with the Norfolk fine sand. The largest areas mapped lie between Choppee and Carvers Bay, near Sampit and to the southwest of Sampit and Georgetown. The long narrow areas are merely swales, through which a part of the drainage waters find their way slowly to

[1] The soil of a typical sample contained 5.83 per cent organic matter and the subsoil 0.63 per cent.

the nearest stream, while the larger ones are more on the order of the so-called "bays," being flats at the heads of some stream courses or in a few instances entirely surrounded by highland. All areas are in a water-logged condition, and the majority of them are covered with shallow water the year round. It is on account of the wet character of the type that such a large quantity of organic matter has accumulated in the soil. With good drainage established, a large part of the organic matter will rapidly disappear, and, owing to its light, sandy nature, unless the soil is handled carefully under cultivation, it will become depleted of this valuable constituent.

On a large proportion of the type the growth is characteristic, consisting of scattering, scrubby pines and a dense undergrowth of bay, swamp laurel, and other bushes, brambles, and moss. In Flat Bay and in some of the narrower strips black and tupelo gums constitute the chief tree growth, and a few of the small pondlike areas support a growth of cypress.

None of the Portsmouth fine sand is cleared, and in its present condition it has no agricultural value. If thoroughly drained, it would grow good crops of corn, hay, and near the railroad probably could be used to advantage in growing Irish potatoes, onions, cabbage, and celery. When first brought under cultivation a heavy application of lime should be made in order to overcome any undue acidity or other properties inimical to plant growth. Occasional lighter applications afterwards would probably prove beneficial also.

In so far as possible the drainage of the type should be undertaken in connection with the reclamation of the more extensive soils, as in this way it could be done more effectually and at a very reasonable cost.

PORTSMOUTH SANDY LOAM.

The soil of the Portsmouth sandy loam, to a depth of 6 to 8 inches, is a black loamy sand to medium light sandy loam, containing a large quantity of organic matter. Below this is a light-gray less coherent sandy loam that grades downward into a heavy sticky sandy loam to a rather plastic sandy clay subsoil at a depth of 15 to 18 inches.

This type occupies low, flat areas in a semiswampy condition. One of the larger areas forms a slightly elevated strip across Gapway Bay. Smaller areas occur about 1 mile farther north on the east side of Gapway Bay, one some 2 miles north of Andrews, and another 4 miles west of Sampit. In the southern part of the county are several small areas, some occupying a low terrace along the edge of the Santee River lowlands.

The original tree growth consisted principally of shortleaf pine and gums. Very little of this is now standing, but none of the type has been cleared for cultivation.

In its present condition the Portsmouth sandy loam is of no agricultural value except for the summer pasturage it affords. If drained, it would grow good corn, oats, and forage crops. It also would prove especially adapted to the production of cabbage, Irish potatoes, onions, and strawberries.

PORTSMOUTH FINE SANDY LOAM.

The soil of the Portsmouth fine sandy loam, to a depth of 4 to 6 inches, is a dark-gray to black loamy fine sand to fine sandy loam, carrying a large quantity of organic matter. Immediately below this is a light-gray to almost white fine sandy loam which becomes heavier as depth increases and passes at a depth of 15 to 18 inches into a gray to bluish-gray sticky fine sandy clay, streaked with rusty-brown iron stains. The clay usually keeps about the same color and texture to a depth of several feet, but in places it is interlain at varying depths with seams of lighter material.

A phase somewhat different from the general run of the type includes the few areas east of the Waccamaw River. Here the soil to a depth of 4 to 6 inches is a dark-gray to black or dark-brown, light-textured fine sandy loam, grading below into a lighter-colored fine sand to fine sandy loam, and this in turn, at a depth of 18 to 24 inches, into a gray or light-brownish gray sticky sandy loam. At varying depths below the soil to a depth of 24 inches is a dark-brownish rather compact layer, known locally as hardpan. In most places this layer occurs at a depth of 8 to 15 inches and its thickness ranges from 4 to 9 inches. This hardpan layer is quite common to the soils of the south Atlantic coast region. In its characteristic development it consists of sand carrying considerable quantities of organic matter and some iron salts, these apparently producing a feeble cementation.

Besides the areas on the Waccamaw Neck already referred to, the type occurs in several places through the central and western sections of the county. One of the largest areas occurs in a long irregular strip northwest of Georgetown. Tupelo Bay, just north of Carvers Bay, is occupied entirely by the Portsmouth fine sandy loam. Other areas occur near Campfield, southwest of Georgetown, and along the western boundary of the county, mainly near Andrews.

The type occupies swampy depressions in the uplands, lying principally within the Coxville types. It is on account of the wet condition of the type prevailing over a very long period of time that such a large quantity of organic matter has accumulated in the soil. As a result of the same conditions the close, clammy nature of the sub-

soil has developed. With good drainage the subsoil would gradually become more friable and the soil would become mellow and easy to till. It would be retentive of moisture and quite productive.

All areas of the type are still timbered, the wettest with gum or a mixture of gum and cypress, and those not so swampy with a mixture of gum, shortleaf pine, etc.

In its present condition the Portsmouth fine sandy loam is unfit for cultivation, but it can be drained and converted into first-class farming land. It would give heavy yields of corn, oats, and forage crops, and in the line of special industries would prove well adapted to strawberries, Irish potatoes, and a variety of garden vegetables. It possibly could be made to grow good celery. After drainage, applications of at least a ton of burnt lime or twice this amount of ground limestone would materially assist in bringing about good physical conditions. Lime is nearly always beneficial to these poorly drained lands.

PORTSMOUTH LOAM.

The Portsmouth loam consists of 12 to 15 inches of a black mucky fine loam to almost a true muck, underlain to a depth of several feet by a dark-gray or medium gray slightly mottled clay or fine sandy clay of clammy and puttylike properties. There is a considerable proportion of fine sand in the soil of much of the type, but the organic matter chiefly accounts for its loamy character.

This type is in a swampy condition and in most places water stands on the surface the year round. This condition, probably existing since the recession of the ocean in prehistoric time, has afforded an ideal environment for the growth of a rank vegetation and for the accumulation of large quantities of leaf mold or mucky material. The same conditions, retarding areation and oxidation, have developed the present unfavorable compact, clammy properties of the subsoil. With good drainage the clay would become gradually more friable and the soil mellow and easy to till. The vegetation is very much the same on all areas, consisting principally of black and tupelo gums, swamp maple, and in places some cypress. There is very little undergrowth where water stands a foot or more deep over the surface, while in areas in a less swampy condition a thick growth of bay, brambles, and other shrubs occur.

The Portsmouth loam is confined to four large, flat depressions in the west-central part of the county, known, respectively, as Carvers, Gapway, Big Kilsock, and Little Kilsock Bays. They are not more than 2 to 4 feet lower than the adjoining Coxville types, but anywhere from 5 to 10 feet lower than the Norfolk fine sand ridge skirting them on the west. They are a part of the old ocean floor, the same as the extensive Coxville areas, the differences in the color and

structural properties of the soil and subsoil being largely the result of the poorer condition of drainage.

The bays are not swampy because they are below sea level, as is believed by some, or the drainage would flow into them from the rivers instead of the other way, as it is now doing. A glance at the accompanying soil map will show that all of the larger creeks rising in the county have their headwaters in these bays. They are swampy simply because they do not have adequate outlets, and they can be effectually drained by clearing the stream courses leading out of them and providing the necessary laterals, either open ditches or tile drains.

The Portsmouth loam has only a nominal value, and this is mostly for the timber it supports. It is unfit for any agricultural purposes in its present condition, but with thorough drainage it will prove well adapted to corn, oats, and forage crops, strawberries, and many truck crops, including Irish potatoes, cabbage, onions, and possibly celery. In addition to these the type, as a whole, offers exceptional opportunities for growing rice after the improved methods now practiced in the great rice belts of Louisiana and Texas. The soil possesses the properties required in good rice lands, namely, a deep, loamy surface soil, with the capacity to supply the crop with an abundance of moisture regularly, and an underlying clay to hold the water during flooding periods and firm enough to allow the use of the heavy machinery necessary in harvesting the crop. In the latter respect the Portsmouth loam differs from the river land, which, on account of the deep, soft muck underlying the soil, are not firm enough to bear the weight of teams and heavy machines.

To put the Portsmouth loam in a condition for rice culture it should be provided with deep channels to the rivers. These should follow the courses of the creeks, and be dug to tide level from the river to the edge of the bays. Smaller canals and open ditches to lower the water table to a depth of some 2 feet below the surface should be provided, using the soil from them to construct the necessary irrigation dikes. A head gate should be put in where the main canal leaves the bay, and a pumping plant installed. When it is desired to flood the rice fields it will only be necessary to close the gate and pump water from below the gate back into the canal above it until the water stands over the rice lands at the required depth. The drainage ditches then would become irrigation canals distributing the water in the same manner as those of the river rice lands. The cost of constructing the main canals would not be prohibitive, because they would not have to be long or very deep. Tide water now backs up the courses of the creeks that would have to be used for distances of 2 miles or more. The large areas of the Portsmouth fine sandy loam in Tupelo Bay and to the northwest of Georgetown

offer similar opportunities for rice culture. In all, there are approximately 20,000 acres of these lands, or nearly twice the acreage devoted to rice in the county since 1870.

The timber on the land probably would bring more than enough to pay for its removal were there a paper mill near at hand to utilize it.

PORTSMOUTH CLAY.

The soil of the Portsmouth clay, to a depth of 6 to 8 inches, is a black clay loam to clay, streaked to some extent with rusty-brown iron stains. The subsoil, to a depth of 3 or more feet, is a dark-gray to bluish-gray tough plastic clay streaked with yellow and rusty-brown iron stains. The clay increases in plasticity with depth to 2 or 3 feet below the surface, where it contains very little sand. On account of the prevailing swampy condition the soil has become much more compact and plastic in its properties than it would be with better drainage. When wet it is soft and plastic, but on drying it becomes hard and harsh and cracks up into irregular fragments. The subsoil also cracks and bakes wherever it is exposed and allowed to dry. As a whole, the type is very uniform in texture, except that in some places more organic remains or mucky material has accumulated on the surface than in others.

The type occurs mainly in the southern half of the county, occupying several shallow, swampy depressions known in general as "swamps" and "bays." Among the larger areas are White Oak Bay, south of Georgetown, Shackleford Swamp, about 5 miles northwest of Georgetown; and Boety, Bino, Cainian, and Waterhole Bays, near the southwestern corner of the county. In appearance and mode of formation these areas are the same as the larger "bays" occupied by the Portsmouth loam, but they differ in the much heavier character of the soil material.

The timber growth varies considerably in the different areas and to a less extent in the same area. The larger part of White Oak Bay supports a heavy growth of oak, gum, and maple, while in the narrower neck as far north as the public road, where a pond has formed back of the road dam, a thick growth of cypress is found. North of the road is a mixed growth of loblolly pine, cypress, and gum. Shackleford Swamp and some of the nearby areas are heavily timbered with cypress, and the group of bays in the southwestern corner of the county with gum and cypress.

The long area crossing the railroad west of Georgetown was cleared and used for the cultivation of rice before the Civil War, but has long since been abandoned. A part of it is now being drained and put under cultivation. Another area cleared for rice culture and subsequently abandoned occurs about 2 miles south of

Andrews. Other than the areas mentioned, none of the type has ever been cleared.

The type is so heavy and impervious in its properties that it will be a difficult problem to drain it thoroughly enough to give satisfactory returns with cultivated crops, although otherwise suited to the growing of corn and grasses. It will also prove difficult to handle. At a reasonable cost it can be drained well enough to grow a good sod of Bermuda grass. This would not only afford the best of pasturage, but would also supply some hay. Japan clover, which makes good pasturage, would also take readily to this soil.

KALMIA SILT LOAM.

The Kalmia silt loam to a depth of 7 to 10 inches is a light but rather compact silt loam or very fine loam with a relatively high percentage of fine sand and silt. The surface soil to a depth of 3 or 4 inches contains a small quantity of organic matter and is gray or light gray in color, while the underlying material is yellow or drab. The subsoil is a yellow and gray silty clay mottled to some extent with red. Near the surface the dominant color of the subsoil is yellow, but below a depth of 2 feet it becomes bluish gray with red mottlings. The clay is characterized by a much lower degree of plasticity than the clays underlying the heavier Coxville types. The soil is easy to till, but clods considerably, partly as the result of imperfect drainage and partly because of the low content of organic matter. With a good supply of humus it would become dark colored, mellow, and quite productive.

The Kalmia silt loam is confined to one area occupying an old terrace at the southwestern corner of the county, intermediate in elevation between the present river swamp and the main highland. From its position it is easy to see that it was built up as a part of the overflow plain of the Santee River when that stream flowed at a higher level. In the main the area is level, but through it are winding narrow depressions, the deeper of which are overflowed by back water from the river swamp during high freshets. In these depressions the soil is darker and stiffer in its properties than that of the higher lying areas and the subsoil is gray and somewhat mottled. The higher levels are not wet, but better drainage would prove beneficial should any of the type be brought under cultivation.

The original timber consisted of a heavy growth of shortleaf pine with an admixture of oak of different varieties, gum, dogwood, beech, and some other hardwoods. Most of the merchantable timber has been removed by lumbermen within recent years.

Less than 100 acres of the type is under cultivation, this being used almost entirely for cotton and corn, which give light yields. With

good management the type should produce good crops of cotton, corn, oats, sorghum, cowpeas, and grasses for forage. Its best uses are for corn, oats, and forage crops.

GEORGETOWN CLAY.

The soil of the Georgetown clay, to an average depth of 8 inches, is a dark-gray to bluish-gray clay to silty clay, finely streaked and specked with yellow and reddish-brown or rusty-brown iron stains. The subsoil to a depth of 3 feet or more varies from a black mucky material, with a considerable admixture of silt and clay, to a light bluish gray soft silty clay carrying a high percentage of light-colored organic matter. Generally the lighter-colored and more clayey subsoil is found immediately along the stream courses. Mucky conditions are common toward the foot of the highlands. The deepest muck has accumulated along the edges of the swamps, where the drainage conditions are poorest, partly as the result of seepage from the uplands. At varying depths the muck gives way abruptly to sandy material or to a heavy clay, more generally the latter. The soil is quite friable and, considering its poorly drained condition, does not bake or clod badly when plowed. This tendency to resist clodding and baking would, with a soil so high in clay, suggest a content of considerable lime, but analysis of a representative sample showed the presence of only 0.25 per cent calcium carbonate in the soil and 0.55 per cent in the subsoil.

This type is developed in the bottom lands along the lower river courses, where it is subject to frequent tidal overflows and is thus in a permanent condition of saturation. Where not protected from overflow the type is really fresh-water marsh or swamp, the overflow water being river water showing but little, if any, contamination with sea water. It seems that at one time in the remote past the coast region was higher above sea level than now, at which time the streams were engaged in active erosion, carving out the wide valleys that now exist. Then there was a gradual subsidence which brought the streams under tidal influence far inland, and for a part of the distance their bottoms became subject to tidal overflow. So instead of the streams continuing to deepen their valleys they began pouring out their sediments over the submerged lands, and back from the streams deep accumulations of muck were formed from the remains of luxuriant swamp growth. The areas along the Sampit and Black Rivers are very similar to those along the Santee and Pee Dee Rivers, although the former streams differ in character. While the smaller rivers carry very little mineral matter in suspension from their own wash, their overflow lands for a certain distance back above the head of Winyah Bay receive deposits from the muddy waters of the Pee Dee backed over them by the tides. Above tidal overflow the bot-

toms of the smaller streams are entirely different from the soils occupying a similar position in the Santee and Pee Dee River swamps. Part of the silt and clay material of the soil has been deposited from the irrigation waters since the land has been brought under cultivation to rice, areas still timbered being mostly a muck to the immediate surface.

With exception of a few small areas this type is confined entirely to the lands cleared for rice culture. It was sought for rice culture on account of its low, wet condition, its unexhaustible fertility, and the fact that by the ebb and flow of the tides it is susceptible of both drainage and irrigation. To bring these lands under cultivation required not only the removal of a heavy growth of cypress, but extensive diking, canalling, and ditching. This was done, however during slavery time, when the cost of labor was low. The lands best suited to rice culture lie from 5 to 10 miles from the coast, along the Santee River, all of those areas along the Sampit and Black Rivers, and those along the Pee Dee and Waccamaw Rivers as far up as Sandy Island. Farther up the Santee and Pee Dee Rivers the freshets are too destructive, while nearer the coast the water is likely to be too salty.

The Georgetown clay was first used for rice culture during early colonial days, and at the opening of the Civil War it was about all under cultivation to this crop. A great deal of it was abandoned during the war and never afterwards reclaimed, but rice continued to be the one important crop of this county until after 1900. Since that year the industry has been almost completely abandoned. It is said that on account of the fact that the land is not firm enough to allow the use of heavy harvesting machinery rice can not be grown profitably in competition with the rice from Louisiana and Texas, where such machinery and many improved methods are in extensive use. Possibly some way will be found to overcome this difficulty and rice will again become an important crop. When rice growing was at its height the crop was so profitable that the lands commanded anywhere from $50 to $300 an acre. Now, in their abandoned state, they can be had for a nominal sum.

Aside from the possibility of rice becoming an important crop, these lands can be drained thoroughly enough to be used for corn and forage crops. It is believed that they can easily be made to produce 100 bushels of corn to the acre. To afford adequate drainage it would be necessary to clean out all of the canals and ditches now existing, to strengthen the dikes, and to install pumping plants to remove the drainage waters. No doubt small areas could be drained by windmills. The drainage should be thorough enough to keep the water table at least 2 feet below the surface. Were this done, the soil would become firm, mellow, and dry enough to grow a variety of crops.

Any tendency to decline in productiveness with constant cropping could be overcome by allowing the lands to overflow with river water once or twice each winter.

CONGAREE CLAY.

The Congaree clay, in its typical development, consists of 8 to 12 inches of a brown or chocolate-brown clay or silty clay, underlain to a depth of 3 feet or more by a come compact silty clay, streaked and mottled to some extent with yellow and rusty-brown iron stains. The soil appears to be a solid light chocolate brown when viewed at a distance, but on close examination is found to be variegated or faintly mottled with shades of brown and gray. It is rather friable in its properties and would be fairly easy to till.

In the many irregular shallow swales and sloughs characterizing the type the soil is heavier and more compact than that of the typical areas and the subsoil is correspondingly heavier and more plastic. Sandier areas are found immediately along the stream courses and on some of the low ridges, known as "islands," scattered through the swamps. Here the soil to a depth of 8 to 12 inches is a brown fine sandy loam to loam, underlain by a lighter-colored brown material of about the same texture. These wide variations are in reality different soil types, but no attempt was made to separate them on account of their small extent.

The Congaree clay is an alluvial type occupying practically all of the bottom lands along the Santee and Pee Dee Rivers above the point where they are overflowed by the tides. It occurs in a wide strip along the Santee River from the southwestern corner of the county to near St. James and Lynches Ferries, and along the Pee Dee from about 6 miles below the Horry County line to the northwestern corner. The material from which the soil is derived has been brought down by the streams largely from the Piedmont Plateau regions of North and South Carolina and deposited over their flood plains during freshets.

This type is closely related to the Georgetown clay in point of origin and original character of material, but the difference in drainage conditions existing since deposition has made the two soils quite unlike. Like the Georgetown clay, the Congaree clay contains only a moderate amount of lime, a representative sample showing a content of 0.22 per cent calcium carbonate in the soil and 0.20 per cent in the subsoil.

The timber growth on this type varies somewhat with the different conditions of drainage. In the sloughs and other swampy depressions the principal growth is cypress or gum and cypress, while in the more extensive nearly level areas there is a heavy mixed growth of sweet gum, water oak, maple, ash, and other hardwoods.

The low elevations previously referred to are heavily timbered with beech, swamp hickory, sweet gum, poplar, maple, ash, white and water oaks, and a scattering of loblolly pine. Very little of the timber has been cut as yet, but it will soon become very valuable.

None of the Congaree clay is under cultivation and it is of no agricultural value in its present condition. To drain it would be a stupendous task involving extensive diking and ditching, and the drainage waters would have to be removed by pumping. Aside from the cost, one of the great troubles in the way of draining these lands successfully is the frequency of very destructive freshets. The soil is almost inexhaustibly fertile, and with even fair drainage established would produce maximum crops of corn and forage.

SWAMP.

All of the streams are bordered by low-lying, swampy overflow strips, varying in width from a rod or so to as much as 5 miles along the Santee River. The river lands with the exception of an area around Indian Lake and those lying along the Black River above tidal overflow are sufficiently uniform in texture and other characteristics to be classed into types. Excepting these and areas along the smaller streams the soils bordering the streams are very swampy and too mixed in character to admit of any accurate separation based upon their mechanical composition. So they are here grouped and described under the term Swamp. The soil is not only variable in different areas, but within the same area as well. In general, the material can be grouped into three classes:

First, the areas along the small streams where the adjoining uplands are mainly the Coxville clay and the Coxville clay loam. Here the soil is a black mucky loam to clay loam 8 to 10 inches deep, underlain by a stiff, plastic gray-colored clay very similar to the subsoil of the Portsmouth clay.

Second, areas with sand and fine sandy loam adjoining uplands. The soil of these consists, for the most part, of a black, mucky, fine sandy loam, resting upon a light-gray fine sandy loam, which at a depth of 10 to 15 inches gives way to a gray colored, stiff plastic clay.

Third, the areas along Black River, Black Mingo Creek, and around Indian Lake, which consist of a coarse, mucky material to a depth of 3 feet or more.

All areas mapped as swamp are heavily timbered, the larger areas mainly with cypress and the smaller areas with a mixture of cypress, gum, maple, and other water-loving trees. Were the swamp drained it would become very productive, producing heavy yields of corn and forage crops. Very likely the larger areas along the creeks could be drained and used for rice after the plan suggested for the Portsmouth

loam. They would drain by a gravity system of ditches and it would only be necessary to use pumps for irrigating the crop. Any of the small creek bottoms are susceptible of drainage simply by canalling and cutting laterals. A great deal along this line no doubt will be done when the extensive flat areas of uplands are drained. The river lands can only be drained by extensive diking and using pumps to remove the drainage water. Aside from the value of these lands for agricultural purposes, their drainage will mean much to the section from the point of view of health.

TIDAL MARSH.

Tidal marsh comprises the low tidal lands along the coast which are subject to daily tidal overflow and are otherwise kept in a marshy condition by salt water. The areas extending across the delta lands of the Santee River and on up to Winyah Bay are very much the same in texture and mode of formation as the old rice lands farther inland, which are also overflowed, but mostly with fresh water. The soil here for the most part is a brownish to gray and brown mottled silty clay with a depth of 4 to 6 inches. This is underlain by a black mucky material smelling very strongly of hydrogen sulphide (H_2S), which grades at a depth of 2 or more feet into sand or some heavier material. Bordering the highlands east of Quarantine the marsh lands are not as frequently overflowed as the areas farther east more directly in the influence of Mosquito Creek, and they receive much less of the sediments from the drainage waters of the Pee Dee and Santee Rivers. Here is found a black coarse muck extending to a depth of 3 feet or more. The large area north of Winyah Bay varies from the clay loam soil, with the muck subsoil as described above, to almost a pure muck, or in places the soil may be a black mucky sandy loam or fine sandy loam. The small areas farther up the coast are mostly of the deep muck and mucky sandy loam phases. The areas to the north of Winyah Bay especially are dissected by an intricate network of tidewater streams.

Some slightly elevated areas scattered through the Tidal marsh are so salty that nothing but salt grass will grow. All other areas support a dense growth of rushes.

Tidal marsh in its present condition is not fit for any agricultural purposes. Large tracts have been bought for hunting preserves, as large numbers of ducks are attracted to them during the winter and early spring months. Possibly at some future time these lands will be drained by diking to keep out the tides and pumping off the drainage waters. This can be done as easily as in the case of the old rice lands or even with less difficulty where the latter are subject to river freshets. Once reclaimed the salt-marsh areas would have about the same productiveness as the Georgetown clay. The excess of soluble

salts [1] in the soil would soon be washed out by the rains. Corn, oats, and forage crops would give heavy yields.

A coarse, tall-growing grass (*Spartina cynosuroides* L.) is seen in many places in the old rice lands (Georgetown clay). This when in seed looks somewhat like Johnson grass, but is of little value as forage.

COASTAL BEACH.

Coastal beach includes the narrow strips of sand immediately along the ocean front and a few smaller areas back from the shore that have been built up by the action of the waves and winds. The material is a gray to light brownish gray sand, varying from fine to coarse in texture, and generally containing a considerable admixture of shell fragments. A strip from 100 to 500 feet wide facing the ocean and swept by the waves and tides is smooth and slopes gradually toward the waters edge. The sand here is free from vegetation and rather compact when wet, but a great deal of it is drifted by the winds when dry. Back of this smooth beach the sands have drifted into ridges and hillocks and dunes, which are at present in the process of formation. On the higher areas least affected by the winds and the landward slope overlooking the salt-water marshes are supporting a tropical growth of live oak, palmetto, etc., some of the groves as on South Island being very picturesque. The small ridges farther back in the marsh lands were formed in the same way as those nearer the coast and are still subject to more or less wind action. Parts of these areas are scatteringly timbered with oak, palmetto, and shortleaf pine. Coastal beach has no value for agricultural purposes.

SUMMARY.

Georgetown County (area 517,120 acres or 808 square miles) lies along the Atlantic Ocean in the eastern part of South Carolina. The elevation ranges from sea level to between 40 and 50 feet above. The surface is predominantly flat. Vast tracts are inadequately drained. The streams are few and sluggish.

The population of Georgetown County in 1910 was 22,270. Georgetown population 5,530, is the county seat and leading market. It is situated at the head of Winyah Bay. Considerable river and ocean shipping make this port.

The climate of the region is mild, with a long growing season and ample rainfall. Scattering farms in the western part of the county are devoted to mixed farming, with cotton and corn as the chief crops. In the eastern part rice culture was formerly an important industry.

[1] A sample of Tidal marsh representative of considerable areas showed on analysis 3.66 per cent of water-soluble salts in the soil and 1.73 per cent in the subsoil, and 4.58 per cent organic matter in the soil and 16.30 per cent in the subsoil.

At present this crop is practically abandoned. Development along other lines has recently been renewed, but agriculture is still in a backward condition. Any general utilitization of the valuable lands of the county will depend upon comprehensive drainage.

Including Swamp, Coastal beach, and Tidal marsh, 24 types of soil were recognized and mapped. These vary widely in texture, color, and structure as well as in origin.

The loose sands along the beach are classed as Coastal beach and all of the marsh land just back of these subject to daily overflow by salt water constitute the Tidal marsh.

The fresh-water alluvial lands along the rivers and smaller streams are of three general classes. The Santee and Pee Dee bottoms, the material being mostly from the Piedmont region, are classed as the Congaree clay as far down as the original rice lands. These are mapped as the Georgetown clay. Most of the smaller bottoms are mapped as Swamp.

The Kalmia silt loam and part of the Norfolk coarse sand and Sandhill areas are of old river terrace origin.

All the other soils are upland types from the Columbia formation. These fall into four series: The Orangeburg series, the Norfolk series, the Coxville series, and the Scranton series.

The Coxville fine sandy loam is an extensive type, imperfectly drained and, except in local areas, unfit for cultivation in its present condition. With good drainage it will become easy to till and to keep in a high state of productiveness. It is adapted to both general farming crops and a variety of special crops. Among the latter are tobacco, strawberries, and a variety of vegetables. It can be drained at a very moderate cost.

The Coxville sandy loam is a much less extensive type than the fine sandy loam, in practically the same poorly drained condition, and adapted to about the same line of farming. Most areas lie near enough to streams to be drained at small cost.

The Coxville clay loam is a heavy upland type with very flat surface features and inadequately drained, but not swampy. On account of its heavy, clammy properties, drainage would be expensive. With fair drainage it could be converted into good Bermuda and Japan clover pastures.

The Coxville clay is a heavy, flat, poorly drained upland type. It would be very difficult to drain thoroughly. None of the type is now under cultivation. Its best use would be for pasture lands.

The Scranton sand and Scranton fine sand are dark loamy sands with a good supply of organic matter. They are very flat and imperfectly drained, the water table standing within 2 feet of the surface. With good drainage they would produce good crops of strawberries, Irish potatoes, and other truck crops for the early market.

They can also be made to produce good yields of cotton, corn, cowpeas, etc.

The Orangeburg fine sandy loam is a well-drained type of very limited extent. Small areas are farmed to cotton and corn. The type is best adapted to peaches and pecans.

Sandhill includes the deep sandy areas with little or no agricultural value.

The Norfolk coarse sand is an unimportant type. It is well drained, but has a low productive capacity owing to its leachy character. The better areas would probably grow good pecans.

The Norfolk sand is a level to undulating light sandy soil, leachy and naturally a light producer of any of the staple crops. The brown phase is used for vegetables, to which it is well adapted. By careful treatment the better areas can be used for cotton and corn.

The Norfolk fine sand is a level to undulating light sandy soil, well drained and leachy. It is used to some extent for cotton and corn, of which light yields are secured. It is best adapted to early vegetables for the northern markets. Pecans, figs, and bright-yellow tobacco are also crops that can be grown.

The Norfolk sandy loam is a well-drained light soil giving light to fair yields of cotton and corn. Yields can be greatly increased by the proper rotation of crops. Adapted to tobacco, truck crops, pecans, and figs.

The Norfolk fine sandy loam is a well-drained easily tilled light soil. It can be kept in a high state of productiveness. It is not extensive and very little is under cultivation, cotton and corn being the main crops. It is the type used so successfully for strawberry culture in Horry County. It is adapted to both general farming and trucking. Tobacco and pecans are promising crops.

The Portsmouth fine sand is a swampy type, unfit for farming in its present condition. It can be drained and converted into fair land for corn and hay, and near the railroad probably for onions, Irish potatoes, and celery.

The Portsmouth sandy loam is a type of small extent. It is poorly drained and of no agricultural value in its present condition. With drainage it would be adapted to corn, oats, forage crops, Irish potatoes, onions, and strawberries.

The Portsmouth fine sandy loam is a wet swampy soil of a semi-mucky character. With drainage it would grow good crops of corn, oats, and forage. It is especially adapted to strawberries.

The Portsmouth loam is an extensive type occupying the large bays throughout the central part of the county. It offers excellent opportunities for growing rice, according to methods followed in Louisiana and Texas. It is also adapted to the same line of farming as the Portsmouth fine sandy loam.

The Portsmouth clay is a heavy swampy type. It will be a very difficult soil to drain thoroughly. It is best adapted to grasses for hay and pasture.

The Kalmia silt loam is an old river terrace type now above overflow. It is flat and not very well drained. Its best use is for cotton, corn, oats, sorghum, cowpeas, and grasses. Small areas now in cultivation give low yields.

The Georgetown clay includes roughly the old rice lands subject to tidal overflow. Once it was all under cultivation, but now it is not used to any extent. With good drainage the soil would be mellow, easy to till, and inexhaustibly fertile. It is especially adapted to corn and forage crops.

The Congaree clay includes the bottom lands of the Pee Dee and Santee Rivers above tidal overflow. It is subject to destructive freshets and is of no agricultural value in its present condition.

The lands classed as swamp can be converted into good lands by drainage. Drained out thoroughly they would grow heavy crops of corn and forage crops.

Tidal marsh applies to the lands along the coast subject to daily overflow by salt water. They can be diked and reclaimed and converted into agricultural lands very similar to the rice lands—Georgetown clay.

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BUREAU OF SOILS
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CURTIS F. MARBUT, IN CHARGE SOIL SURVEY

SOIL MAP

SOUTH CAROLINA
GEORGETOWN COUNTY SHEET

SOIL PROFILE
(3 feet deep)

- Norfolk coarse sand: Cs / Cs
- Norfolk sand: S / S
- Norfolk fine sand: Fs / Fs
- Norfolk sandy loam: Ls / Sc
- Norfolk fine sandy loam: Lfs / Fsc
- Portsmouth fine sand: Lfs / Fs
- Portsmouth sandy loam: Lsl / Sl / Sc
- Portsmouth fine sandy loam: Lfs / Fsl / Fsc
- Portsmouth loam: L / Fsc
- Portsmouth clay: C / C
- Scranton sand: Ls / S
- Scranton fine sand: Lfs / Fs
- Coxville sandy loam: Lsl / Sl / C
- Coxville fine sandy loam: Lfsl / Fsl / C
- Coxville clay loam: Cl / C
- Coxville silt: C / C
- Orangeburg fine sandy loam: Lfs / Fsc
- Kalmia silt loam: Sil / Sic
- Georgetown clay: Sic / Sic
- Congaree clay: Sic / Sic
- Sandhill: S
- Coastal beach: S

LEGEND

Cs Coarse sand
S Sand
Fs Fs-Fine sand
Ls Loamy sand
Sc Sandy clay
Lfs Loamy fine sand
Fsc Fine sandy clay
Lsl Light sandy loam
Sl Sandy loam
Fsl Fine sandy loam
L Loam
C Clay
Lfsl Light fine sandy loam
Cl Clay loam
Sil Silt loam
Sic Silty clay

LEGEND

- Norfolk coarse sand: Nc
- Norfolk sand: N
- Norfolk fine sand: Nf
- Norfolk sandy loam: Ns
- Norfolk fine sandy loam: Nl
- Portsmouth fine sand: Pf
- Portsmouth sandy loam: Psl
- Portsmouth fine sandy loam: Pl
- Portsmouth loam: P
- Portsmouth clay: Pc
- Scranton sand: Ss
- Scranton fine sand: Sf
- Coxville sandy loam: Cs
- Coxville fine sandy loam: Cf
- Coxville clay loam: Cc
- Coxville clay: C
- Orangeburg fine sandy loam: Of
- Kalmia silt loam: Ks
- Georgetown clay: Gc
- Congaree clay: Cl
- Sandhill: Sh
- Swamp: S
- Coastal beach: Cb
- Tidalmarsh: Tm
- Swampy areas

Hugh H. Bennett, Inspector in charge Southern Division
Soils surveyed by W.E. Mc Lendon
G.A. Crabb, M. Earl Carr and F.S. Welsh

Scale 1 inch = 1 mile

Field Operations
Bureau of Soils
1911